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THE UNEQUAL SEGMENTATION OF PUBLIC PREPAREDNESS FOR MASS EVACUATION
– A CROSS-NATIONAL PERSPECTIVE

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Doctor of Philosophy

ASTON UNIVERSITY

November 2014

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Thesis Summary

This thesis is concerned with understanding how Emergency Management Agencies (EMAs) influence public preparedness for mass evacuation across seven countries. Due to the lack of cross-national research (Tierney et al., 2001), there is a lack of knowledge on EMAs perspectives and approaches to the governance of public preparedness. This thesis seeks to address this gap through cross-national research that explores and contributes towards understanding the governance of public preparedness. The research draws upon the risk communication (Wood et al., 2011; Tierney et al., 2001) social marketing (Marshall et al., 2007; Kotler and Lee, 2008; Ramaprasad, 2005), risk governance (Walker et al., 2010, 2013; Kuhlicke et al., 2011; IRGC, 2005, 2007; Renn et al., 2011; Klinke and Renn, 2012), risk society (Beck, 1992, 1999, 2002) and governmentality (Foucault, 1978, 2003, 2009) literature to explain this governance and how EMAs responsibilize the public for their preparedness.

EMAs from seven countries (Belgium, Denmark, Germany, Iceland, Japan, Sweden, the United Kingdom) explain how they prepare their public for mass evacuation in response to different types of risk. A cross-national (Hantrais, 1999) interpretive research approach, using qualitative methods including semi-structured interviews, documents and observation, was used to collect data. The data analysis process (Miles and Huberman, 1999) identified how the concepts of risk, knowledge and responsibility are critical for theorising how EMAs influence public preparedness for mass evacuation. The key findings grounded in these concepts include:

- Theoretically, risk is multi-functional in the governance of public preparedness. It regulates behaviour, enables surveillance and acts as a technique of exclusion.
- EMAs knowledge and how this influenced their assessment of risk, together with how they share the responsibility for public preparedness across institutions and the public, are key to the governance of public preparedness for mass evacuation. This resulted in a form of public segmentation common to all countries, whereby the public were prepared unequally.
- EMAs use their prior knowledge and assessments of risk to target public preparedness in response to particular known hazards. However, this strategy places the non-targeted public at greater risk in relation to unknown hazards, such as a man-made disaster.
- A cross-national conceptual framework of four distinctive governance practices (exclusionary, informing, involving and influencing) are utilised to influence public preparedness.
- The uncertainty associated with particular types of risk limits the application of social marketing as a strategy for influencing the public to take responsibility and can potentially increase the risk to the public.

Keywords: Emergency Preparedness, Governance, Risk and responsibility, Social Marketing, Behaviour Change

Dedication

This thesis is dedicated to my husband, Justin Barnett, for all the support and much more that he has given me over the last few years. It is with his support and encouragement that I have been able to do this.

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Chapter 1. Introduction

There is a lack of cross-national research on public preparedness for emergencies and evacuation covering the organisational, state and national levels (Tierney et al., 2001) of most countries. Furthermore, research investigating public preparedness provides many hazard specific recommendations on how public preparedness can be influenced. However, there is limited knowledge on how, or if, these recommendations are being implemented by the Emergency Management Agencies (EMAs) responsible for preparing the public. As EMAs have a key role in developing and implementing preparedness strategies, it is important to understand their perspective of preparedness as well as the similarities and differences of the governance across countries. Understanding EMAs perspectives can thus contribute to a more thorough understanding of cross-national research on public preparedness for mass evacuation. This thesis seeks to explore the roles of EMAs in seven countries (Belgium, Denmark, Germany, Iceland, Japan, Sweden and the United Kingdom (UK)). It aims to theorise and explain how their role contributes towards the governance of public preparedness in practice. Empirical evidence provides insight into how EMAs apply their knowledge when they are faced with the risk of different types of hazard and aim to influence and responsabilize their public to prepare for mass evacuation.

The following sections outline the key themes that this research explores before moving on to provide background information on how the research questions emerged and developed.

1.1 Influencing public preparedness for mass evacuation

Benefits of public preparedness were recently evidenced during the 2011 disasters in Japan (Norio et al., 2011), the 2010 eruptions of Mount Merapi (Indonesia), and Cyclone Giri (Myanmar) (Riesmasari and Kumar Kafley, 2011). It is typically the role of EMAs and government officials to educate their public about preparedness and to ensure that they are prepared to respond to a disaster. Disasters involve widespread impacts and seriously disrupt how a community functions (UNISDR, 2007). To protect the public from the impact of disasters, evacuation may be the best option (Guion et al., 2007). The public can undertake actions before a disaster occurs to ensure that they are ready to respond. This is termed preparedness in the academic literature (Tierney et al., 2001) and is part of risk management (Christoplos et al., 2001). The public may prepare for mass evacuation by storing resources necessary for evacuation and sheltering (e.g. food, water, medicine), creating family plans including information on meeting points and contact telephone numbers, and gaining knowledge of local and regional plans that outline evacuation routes and shelter locations (Redlener and Berman,

2006). Undertaking preparedness actions such as these reduces the risk of death, injury and property damage, and improves the public's response to the impacts of a disaster (Paton, 2007) and their evacuation response (Perry, 1979a; Perry et al., 1981; Perry and Greene, 1982, 1983).

1.2 Theorising risk for public preparedness

Notably developing the concept of risk is key to the research. In both practice (Twigg, 2004) and the academic literature (Tierney et al., 2001; Wood et al., 2011), the focus is on the use of risk communication to influence public preparedness. However, as will be examined in Chapter 2, there are limitations associated with the use of risk communication for influencing public preparedness (Wood et al., 2011; Terpstra et al., 2009; Ballantyne et al., 2000; Becker, 2012). There is limited research on the effectiveness that risk communication has on influencing public preparedness, and studies investigating its effectiveness provide limited conclusive evidence (Wood et al., 2011; Terpstra et al., 2009; Haynes et al., 2008; Nathe, 2000; Mileti and Peek, 2002). Studies also show how risk communication can negatively influence public preparedness (Ballantyne et al., 2000; Becker, 2012). There are also inconsistent research findings on the factors, including risk perception, that influence the public to undertake preparedness actions (Lindell and Perry, 2004). Thus, in addition to identifying the importance of researching EMA perspectives of public preparedness (Tierney et al., 2001), this research also identified the need to draw on alternative disciplines to conceptualise the concept of risk in relation to public preparedness.

1.3 The responsibility for public preparedness

The concept of responsibility is also central to this research as a prepared public requires both EMAs and the public to take responsibility. EMAs have a responsibility to ensure that their public are prepared for different types of hazard (Somers and Svara, 2009). For Christoplos et al. (2001), governments and local institutions are considered the most important actors as they have ultimate responsibility for their public's safety. However, it is not only EMAs that must accept responsibility for public preparedness. *"Individuals and families will need to fend for themselves for about 3 days after a major disaster (Russell et al., 1995). A well-prepared community, therefore, requires shared responsibility by local government and households in the community"* (Basolo et al., 2009, p.341). The need for the public to also take responsibility for their security is also outlined by Alexander (2005) who outlines how; *"in today's complex world it is hard to see how the public can be protected adequately unless it takes some responsibility for its own security, as the task is simply too great for civil*

administrators to accomplish alone” (p.172). Whilst it is acknowledged that both EMAs and the public should accept responsibility for public preparedness, the literature highlights a need to further understand the concept of the responsibility for public preparedness, particularly from an institutional perspective.

1.4 Social marketing

Social marketing is the alternative approach to influencing public preparedness examined by this research. It involves the application of marketing to influence behaviour change for the benefit of the individual and society (Andreasen, 1994; French and Blair-Stevens, 2007). Marketing tools and techniques are increasingly being used by governments and public sector organisations to attempt to influence public behaviour change (Raftopoulou and Hogg, 2010). Social marketing has been used by government organisations in Canada (Kotler and Lee, 2008) and the United States of America (USA) (Marshall et al., 2007) to effectively influence their public to undertake emergency preparedness behaviours. However, there is a need to further understand social marketing’s application to emergency management contexts due to the limited research in this area (Ramaprasad, 2005). This is particularly important because of the criticisms and ethical concerns that have been levelled at social marketing based on the power issues associated with its application (Raftopoulou and Hogg, 2010; O’Shaughnessy, 1996; Brenkert, 2008).

1.5 Evacuation Responsiveness by Government Organisations (ERGO) research project

The data collection for this thesis is grounded in the research that was undertaken for the Evacuation Responsiveness by Government Organisations (ERGO) project. The ERGO research project was a three year European Commission funded project (JLS/2007/CIPS/025) investigating how EMAs plan and prepare both themselves and the public for mass evacuation. The focus of the ERGO project was on planning and preparedness for large-scale evacuations (Shaw et al., 2011). This researcher joined the project in August 2008 to focus specifically on the public preparedness stream. Two fellow doctoral researchers were also recruited, one to examine EMA preparedness and the other to examine the combination of EMA and public preparedness. In total, the ERGO project examined six parts of mass evacuation planning; public preparedness, the evacuation zone, the evacuation decision, the warning message, transportation and shelter management.

Whilst the ERGO project originally included six countries, significant interest in the research resulted in the participation of ten countries (Belgium, Bulgaria, Denmark, Germany, Iceland, Poland, Spain,

Sweden, the UK and Japan). The research enabled preparedness approaches to be examined cross-nationally and provided empirical evidence to show how evacuation may be undertaken in response to different types of risk. For example, when there is advanced notice of a hazard occurring (e.g. hurricanes, floods), or in situations such as a terrorist attack when the incident has already occurred and the public needs to be removed from the affected area (Haddow et al., 2011). The risks that EMAs participating in the ERGO project were preparing themselves and their public for included earthquakes, volcanoes, floods, terrorism and nuclear accident. The research also included multiple levels of government and organisations in order to gain a broader understanding of preparedness in each country.

As ERGO was a three year project, the researcher established working relationships with EMAs across the participating countries. She had the opportunity to engage with and observe a range of EMA stakeholders. Although ERGO included ten countries, the data from seven countries (Belgium, Denmark, Germany, Iceland, Sweden, the United Kingdom and Japan) was selected for the thesis due to the different data collection methods used in Spain and significant language barriers in Bulgaria and Poland. The researcher made data collection visits to all countries, with the exception of Iceland, where semi-structured interviews were conducted with EMA representatives including emergency managers, civil protection and government officials, communication experts, first responders, non-governmental organisations (NGOs), and voluntary organisations involved in planning and preparing for mass evacuation. The researcher also worked with EMA representatives during the 'feedback' visits to Belgium, Denmark, Germany and the UK and during the events that were organised to share best practices on EMA approaches to preparedness. The table at the end of this chapter shows descriptive and contextual information on the seven countries that were selected for the thesis.

The next section outlines the different approaches to influencing public preparedness and the approach used in this research.

1.6 Justification for the research focus on public preparedness

The researcher was aware of different approaches that could have been utilised to investigate this area. The emergency management literature was consulted first to understand how public preparedness could be influenced. Despite its importance, limited research on EMAs perspectives of preparedness was identified, as studies focused predominantly on the response to an incident (McEntire and Myers, 2004). Emergency management studies focusing on preparedness typically examined the preparedness actions, also termed hazard adjustments, that the public undertake to prepare for a particular hazard

such as earthquakes (Mulilis et al., 1990), tsunamis (Paton et al., 2009; Johnston et al., 2005), or hurricanes (Blendon et al., 2007). Preparedness actions studied include having items (e.g. water, food, torch, radio, batteries) and a plan ready for when an incident occurs and participating in an evacuation drill (Mulilis et al., 1990; Paton et al., 2005; Paton et al., 2009; Wood et al., 2011). Of interest to the researcher is how EMAs influence the public to undertake preparedness behaviours and this was not the main focus of these studies.

Two main areas of emergency management literature focus on influencing public preparedness. This literature is reviewed in Chapter 2 and investigates how risk communication and a range of other factors (e.g. risk perception, characteristics of the receiver of information) influence the public to undertake preparedness actions (Tierney et al., 2001; Wood et al., 2011; Lindell and Perry, 2000; Lindell and Whitney, 2000). This body of literature provides lessons for EMAs on how to influence the public to prepare.

1.6.1 Methodological limitations in the emergency management literature

Quantitative studies in the emergency management literature have received criticism based on their methodology. Significantly different variables (i.e. actions) have been used as measures of public preparedness (Tierney et al., 2001; Lindell and Perry, 2000). Although there have been attempts to standardise how preparedness is measured, *“the theoretical variables that have been examined in studies on preparedness, the operationalization of those variables, and the research designs still vary considerably”* (Tierney et al., 2001, p.34). Therefore, the need for a more thorough conceptualisation of preparedness and how it is assessed has been identified (Paton, 2003).

The emergency management literature also focuses predominantly on preparedness at the household and individual level, neglecting EMAs perspectives of the concept of preparedness. Tierney et al. (2001) outline how *“as the [research] focus moves from households through organizations, communities, states, and nations, progressively less research exists. The amount we know is...inversely related to the level of analysis studied”* (Tierney et al., 2001, p.79). Whilst the literature provides knowledge of the households that prepare and why they prepare, there is limited research on EMA perspectives of public preparedness (Tierney et al., 2001). These weaknesses highlighted the need to identify an alternative approach to understand how EMAs could influence the public to undertake preparedness actions.

In reviewing alternative approaches, the researcher turned to the psychology literature on behaviour change (Prochaska and DiClemente, 2005; Ajzen and Fishbein, 1980; Ajzen, 1991), as influencing public

preparedness is ultimately concerned with influencing their behaviour. Information on the main behaviour change theories and models reviewed is provided in Appendix 1. To summarise, the transtheoretical model, also termed stages of change, (Prochaska and DiClemente, 2005) focuses on the treatment of health behaviours and showed how behaviour change is a process consisting of five stages; precontemplation, contemplation, preparation, action and maintenance. The theory of reasoned action (Ajzen and Fishbein, 1980) and the theory of planned behaviour (Ajzen, 1991) provided an understanding of the factors that influence behaviour change. The theory of reasoned action (Ajzen and Fishbein, 1980) stipulates that a person's behavioural intention predicts the likelihood of them performing the behaviour. A person's behavioural intention is influenced by their attitude to the behaviour and by their subjective norms (i.e. the perceived social pressure to perform the behaviour). The theory of planned behaviour (Ajzen, 1991) is the development of the theory of reasoned action with the addition of perceived behavioral control, concerned with the perceived difficulty of performing the behaviour. Whilst this literature provided an understanding of behaviour change, the theories and models also focused on the individual level, which as outlined above is already the predominant focus of the emergency management literature. However, social marketing is an area of behaviour change that has been applied to emergency preparedness (Guion et al., 2007). It is "*the systematic application of marketing alongside other concepts and techniques, to achieve specific behavioural goals, for a social good*" (French and Blair-Stevens, 2007). It provides an approach that overcame the weaknesses of the emergency management and psychology literature by not focusing solely on individual behaviour change (downstream social marketing), but also on the behaviours of policy and decision makers (upstream social marketing) who can influence the behaviour in different ways. Whilst individuals are responsible for undertaking preparedness actions such as storing useful resources, social marketing recognises that it is not only the individual that is responsible for behaviour change (Andreasen, 2006; Hastings and Donovan, 2002).

1.7 Research aims and objectives

The initial review of the approaches focusing on influencing public preparedness identified gaps that this research seeks to address. This research aims to explore how EMAs influence the public to prepare for mass evacuation by understanding how their role contributes to the governance of public preparedness. The objectives of this research are to:

- Theorise how EMAs influence the public to prepare for mass evacuation through an understanding of the governance of public preparedness

- Examine the concept of the responsibility for public preparedness from an institutional perspective
- Consider social marketing as an alternative approach to influencing public preparedness for mass evacuation

Thus far, this chapter has introduced the research aims and objectives. It has outlined the key themes addressed by this research and how it was the researcher's role on the ERGO project that identified the need for research investigating EMA perspectives of public preparedness for mass evacuation. It has also highlighted the different areas of the public preparedness literature. The next section outlines the structure of this thesis.

1.8 The thesis structure

The thesis consists of eight chapters.

Chapter 2 highlights the absence of literature on public preparedness from an institutional perspective and critically reviews the existing literature on public preparedness. The chapter first examines the two main areas of emergency management literature; the design of risk communication and the factors that influence the public's decision whether to undertake preparedness actions. The strengths, weaknesses and ethical issues associated with social marketing's application are then examined as there has been limited research on social marketing's application to influencing public preparedness. The chapter concludes by collectively examining the three areas of literature to develop the research questions that this research addresses. The three areas are examined based on their lack of focus on the institutional perspective of preparedness, the limited literature on the role that responsibility has and in terms of the different elements of a preparedness strategy. This illustrates the commonalities across the emergency management and social marketing literature. It will show how both areas of literature recommend that approaches designed to influence the public to undertake preparedness behaviours should: involve more than one-way communication to the public (e.g. through interaction with the public), use different approaches to target different groups of the public (e.g. tailoring communications to the needs of a particular group such as the elderly and immigrants), and consider the effectiveness/benefits of preparedness actions (e.g. saving lives) and the resources required (e.g. time) for the public to prepare.

Chapter 3 reviews the theoretical literature and concepts that are used to explain the findings of this research. The discussion examines the literature on risk governance (Walker et al., 2010, 2013;

Kuhlicke et al., 2011; IRGC, 2005, 2007; Renn et al., 2011; Klinke and Renn, 2012), Beck's risk society thesis (1992, 1999, 2002), and Foucault's theory of governmentality (1978, 2003, 2009) to theorise how EMAs influence public preparedness for mass evacuation and to understand the concept of the responsibility for public preparedness.

The literature on risk governance provides an understanding of recent changes in how hazards are governed by institutions, including; a shift to multi-level governance, the involvement of a multiplicity of actors, and changes in the distribution of responsibility. The risk governance framework is drawn on to examine; how not all risks are the same, how different risks are characterised by different levels of uncertainty, complexity and/or ambiguity and how there may be no awareness of a risk (International Risk Governance Council (IRGC), 2007; Beck, 1999). The work of Beck (1992, 1995, 1999, 2002) also focuses on risk and is utilised to understand how particular types of risk are not and cannot be managed by institutions and the implications that this may have on how the public are prepared for mass evacuation. Foucault's (1978, 2003, 2009) concept of governmentality is a theoretical concept for understanding the different techniques that institutions may use to govern their public to prepare and accept more responsibility for their preparedness. The chapter examines techniques for acting upon the actions of others (i.e. techniques of power) and the related concepts of the Panopticon and biopolitics. It also examines techniques concerning the conduct of oneself (i.e. techniques of the self) and how the public are encouraged to take responsibility for different social issues. The concepts outlined in this chapter will be used in subsequent chapters of this thesis to interpret and conceptualise the findings of this research.

Chapter 4 justifies the methodological approach selected to explore the research questions. It explains why the selected qualitative multiple case study research design was considered most appropriate. The limitations of cross-national research and the ethical issues of conducting cross-national research will also be addressed. The chapter will also outline the techniques used to analyse and interpret the data and establish the themes that are discussed in Chapters 5 and 6.

Chapter 5 outlines the findings on how public preparedness is governed at an institutional level. It will show how there were three main influences on how public preparedness was governed: responsibility, risk and EMAs knowledge. The chapter will demonstrate how these three influences resulted in a segmented approach to preparedness with particular levels of government and organisations preparing the public in particular areas for particular risks.

Chapter 6 identifies the practices used to influence the public to prepare across the seven countries. Four practices are discussed in this chapter; exclusionary, informing, involving and influencing. The parallels between informing and risk communication will be highlighted as well as those between influencing practices and social marketing. The chapter examines how each practice differs in terms of; its level of implementation, its desired goals, the groups of the public that are targeted and excluded, and the level of responsibility that is transferred to the public. It will also highlight how, to different extents, each country has particular groups of the public that are excluded and that are not targeted with preparedness approaches.

Chapter 7 discusses the findings in relation to the research questions, theory and established literature. The chapter summarises the evidence to propose that the concepts of risk, knowledge and responsibility are critical for theorising how EMAs influence public preparedness for mass evacuation. The key findings grounded in these concepts and discussed in relation to theory, include:

- Theoretically, risk is multi-functional in the governance of public preparedness. It regulates behaviour, enables surveillance and acts as a technique of exclusion.
- EMAs knowledge and how this influenced their assessment of risk, together with how they share the responsibility for public preparedness across institutions and the public, are key to the governance of public preparedness for mass evacuation. This resulted in a form of public segmentation common to all countries, whereby the public were prepared unequally.
- EMAs use their prior knowledge and assessments of risk to target public preparedness in response to particular known hazards. However, this strategy places the non-targeted public at greater risk in relation to unknown hazards, such as a man-made disaster.
- A cross-national conceptual framework of four distinctive governance practices (exclusionary, informing, involving and influencing) are utilised to influence public preparedness. These practices are explained through established theories addressing the key concepts of knowledge, risk and responsibility.
- The uncertainty associated with particular types of risk limits the application of social marketing as a strategy for influencing the public to take responsibility and can potentially increase the risk to the public.

The thesis concludes with Chapter 8 which outlines the contributions that this research has made to practice and policy. Chapter 8 also examines the strengths and limitations of the research and outlines opportunities for further research.

Table 1.1 Contextual information on the seven countries (adapted from Shaw et al., 2011)

	Japan	Germany	United Kingdom	Sweden	Belgium	Denmark	Iceland
Planning Scenario							
Recent primary focus	Earthquake	Storm surge flooding	Terrorism	Nuclear accident	Nuclear accident	Terrorism	Volcanic floods
Nature of advanced warning	No warning	Rising tide (slow)	No warning	No warning	No warning	No warning	Volcanic activity
Other scenarios	Tsunami Terrorism Removal of World War 2 bombs	Terrorism Large gatherings Nuclear accident	Flood Industrial accident	Storm Forest fire	Flood Removal of World War 2 bombs	Flood Nuclear accident	Earthquake Avalanches Lava Mud flows
Significant events	Kobe earthquake (1995)	North Sea Flood (1962)	7/7 terrorist attacks (2005)	Chernobyl fallout (1986)	None	Seest fireworks disaster (2004)	Avalanches (1995)
Country Background							
Date of entry into the EU	NA	1957	1973	1995	1957	1973	NA
System of government	Unitary parliamentary democracy	Federal parliamentary republic	Unitary parliamentary democracy	Unitary parliamentary democracy	Federal parliamentary republic	Unitary parliamentary democracy	Unitary parliamentary democracy
Population size	126m	81m	62m	10m	10m	5m	300,000
Economy (National GDP)	\$4 trillion	\$3 trillion	\$2 trillion	\$354 billion	\$395 billion	\$305 billion	\$12 billion
Diversity							
	1% (Other)	2% (Turkish)	2% (Black)	5% (Finnish)	58% (Fleming)	10% (Other)	3% (Polish)
	1% (Korean)	6% (Other)	2% (Indian)	3% (Other)	31% (Walloon)	Serbian	
		Italian	2% (Other)		11% (Mixed or Other)	Faeroe Islander	
		Polish	1% (Pakistani)			Turkish	
Country age structure (median age)	45	44	40	42	42	41	35
0-14	13% male 8,804,465 female 8,344,800	14% male 5,768,366 female 5,470,516	17% male 5,233,756 female 4,986,131	16% male 733,597 female 692,194	16% male 857,373 female 822,203	18% male 511,882 female 485,782	21% male 32,268 female 31,308
15-64	64% male 41,187,425 female 40,533,876	66% male 27,707,761 female 26,676,759	67% male 20,774,192 female 20,246,519	66% male 3,003,358 female 2,927,038	66% male 3,480,072 female 3,419,721	66% male 1,817,800 female 1,798,964	67% male 104,158 female 101,158
65 years and over	22% male 11,964,694 female 16,243,419	20% male 7,004,805 female 9,701,551	16% male 4,259,654 female 5,612,953	19% male 753,293 female 950,171	18% male 760,390 female 1,074,477	16% male 387,142 female 488,940	12% male 16,952 female 20,424
Visit Location							
Level of analysis	National	City / Regional	City	National	National	City / Regional	National
Population size	126m	1m	7m	10m	10m	500,000 / 2m	300,000

	Japan	Germany	United Kingdom	Sweden	Belgium	Denmark	Iceland
Size of area (sq. km)	400,000	800 / 2,000	1,600	400,000	30,000	88 / 3,000	100,000
Evacuation Planning							
Laws underpinning evacuation	Civil Protection Law	Federal law – civil protection in case of war	Civil Contingencies Act 2004	Rescue Services Act	Royal Decrees 1988, 2003 & 2006	Danish Contingency Act 1624	Civil Contingency Law 2008
Exercises	Terrorism	Hazard specific	Table top and Field	Nuclear and Field	Nuclear	Table top	Field
Responsible agency	EMA	Department of Interior	Local Resilience Team & Cabinet Office	EMA	EMA	EMA	Department of Interior – Civil Contingencies

Chapter 2. A Review of the Literature on Influencing Public Preparedness; Risk Communication, the Protective Action Decision Model (PADM) and Social Marketing

2.1 Introduction

This chapter reviews the existing literature on influencing public preparedness. It will outline how the existing emergency management literature has predominantly focused on two main areas of research; risk communication and the factors influencing public preparedness. The literature on social marketing will also be introduced to highlight how this approach has been used to influence public preparedness behaviours. The theories, models and research underpinning each area of literature will be discussed along with the critique. The chapter concludes by outlining four research questions that emerged following the review of the emergency management and social marketing literature.

2.2 Risk communication

EMA approaches to public preparedness typically involve preparing the public through education and by communicating preparedness information to the public (Twigg, 2004). This approach to public preparedness is termed risk communication in the academic literature. Although there is a long history of the ideas underpinning risk communication, it was only formally established as a field of research in the 1980s (Lindell and Perry, 2004). Risk communication is concerned with the exchange of information about different types of risk between different stakeholders (Covello et al., 1986). It covers many areas including lifestyle choices, occupational activities, consumer products, technological facilities and natural hazards (Lindell and Perry, 2004). The risk communication literature on public preparedness for natural and man-made hazards will be reviewed below.

Risk communication draws on a wide range of disciplines to understand how to communicate risk information to the public including *“psychology, sociology, medicine, public health, public policy, cognitive science, risk management and more”* (Wood et al., 2011, p.2). The goals of risk communication highlight its relevance to this research; *“to advance knowledge, to influence individual behaviours (regarding enduring hazards or acute emergencies), and to deal with risk problems on a communal level”* (Rohrmann, 1998, p.105). For Lindell and Perry (2004), the primary goal of risk communication is the initiation of protective action.

Studies investigating the influence of risk communication on public preparedness draw on communication theory to guide the research (Lindell and Perry, 2004; Wood et al, 2011; Mulilis, 1998). Researchers examine the different elements of the Classical Persuasion Model (Figure 2.1) developed

by Lasswell (1948) to understand the characteristics of effective risk communication. Thus, reviewing the literature on risk communication provides an understanding of how EMAs may influence public preparedness. The Classical Persuasion Model (Figure 2.1) includes five elements; source, message, channel, receiver and the effect of the communication. For Lasswell (1948), *“all communication should be analysed in terms of who (source) says what (message), via what medium (channel) to whom (receiver), and directed at what kind of change (effect)”* (Lindell and Perry, 2004, p.14). The following sections examine the existing literature investigating how these elements of communication can (not) influence the public to prepare.

Figure 2.1 The classical persuasion model (taken directly from Lindell and Perry, 2004, p.14)



The majority of studies tend to assume that receiving information changes people’s preparedness belief which in turn influences the public to undertake preparedness behaviours (Terpstra et al., 2009). However, as shown below there is limited research evaluating the effectiveness that risk communication has on public preparedness.

2.2.1 The source of preparedness information

There are a variety of different sources that can be used to communicate preparedness information to the public. Sources of preparedness information may include different levels of government, scientists, police, schools and friends, family and neighbours (Basolo et al., 2009; Ballantyne et al., 2000). Each source can have a different influence on the public’s preparedness and their response to future information.

A study analysing the effectiveness of a brochure influencing Parkfield (California) residents to prepare for earthquakes focused on the information provider. It found that preparedness communications material should come from *“official government sources”* but should also include details of additional sources of information including scientists (Mileti et al., 1992, p.38). Multiple information sources were also considered important in terms of reinforcing the authenticity of the information in the brochure.

Other studies have also examined how *“people’s willingness to use information to guide their actions will be influenced by the degree to which they trust its source”* (Paton et al., 2009, p.29). Research was undertaken with 344 members of the public from Alaska and 512 from Oregon at risk from tsunamis to investigate the influence that the public’s trust in the source of information had on preparedness (Paton et al., 2009). The findings highlighted how the public’s feelings of trust were influenced by the belief that agencies were withholding information from them, which in turn reduced the likelihood of them preparing. Paton et al. (2008b) also investigated how trust in the information source influenced public preparedness for different types of hazard. They identified that for a low familiarity (frequency of exposure)/low information (availability of information) hazard, there were inconsistencies in the information provided by different sources. Kee and Knox (1970) outline how inconsistency reduces source credibility. The study by Paton et al. (2008b) also found that for low familiarity hazards the public’s evaluation of the information source determines their actions and that the public’s reliance on expert sources is higher.

Having too much trust in an information source has also been found to negatively influence public preparedness. Research by Basolo et al. (2009) investigating earthquake preparedness in Los Angeles County and Hurricanes in New Orleans found mixed results on how trust in the information source influences preparedness. The study called for further research on the public’s feelings towards government and the division of responsibility for preparedness. In 2008, Becker et al. (2012) conducted 48 interviews with members of the public from three communities in New Zealand to investigate how earthquake information influenced public preparedness. Whilst the research found that if people trusted the information they are more likely to prepare, it also found that if trust in an agency is too high, this would result in the public believing that they do not need to prepare as the agency will look after them. Thus, the public having too much trust in an agency can result in them transferring the responsibility for preparedness to the agency.

2.2.2 The preparedness message and message content

Mileti and Peek (2002), Nathe (2000) and Nathe et al. (1999) highlight three issues that preparedness messages should include; the potential losses, the probability of the hazard occurring within a specific time period and directions to reduce the losses. However, these recommendations are based on experience and combining the finding of numerous studies. The authors did not provide additional empirical evidence of the effectiveness of their recommendations.

Whilst the emergency management literature provides general recommendations for preparedness message content, research has been undertaken in the field of social psychology that provides partial support for the recommendation. Although the person-relative-to event (PrE) model (Duval and Mulilis, 1999; Mulilis and Duval, 1995) is grounded in the social psychology literature, it has been applied to examine public preparedness for natural hazards including earthquakes and tornadoes. The model empirically examines how a particular type of communication, a negative threat appeal, can be used to influence the public to prepare. In brief, the PrE model *“asserts that people’s decision about protective behavior are determined by the level of threat in relation to their personal resources”* (Lindell and Perry, 2004, p.43).

Mullis and Duval (1995) and Duval and Mullis (1999) trace the origins of the PrE model back to the use of persuasive communications. Early research in this area focused on persuasive communications known as fear-arousing (Janis and Feshbach, 1953) or negative threat appeals (McGuire, 1985). This type of communication was concerned with using messages to convince a person that they were at risk in terms of the occurrence of an event. With a person believing that they were at risk, they were presumed likely to undertake activities to avert the risk. Research to date has focused on identifying the variables, the level of variables and combination of variables that make this type of communication most effective (Duval and Mulilis, 1992, 1999; Mulilis and Duval, 1995, 1997). Protection Motivation Theory (Maddux, 1983; Rogers, 1975, 1983), also a theory of persuasive communication, *“indicates that variables concerned with both the event (i.e., severity and probability of occurrence) and the person (i.e., self-efficacy and outcome efficacy) are critical in determining the effectiveness of a risk communication”* (Mulilis and Duval, 1995, p.1320). Including variables associated with the event (i.e. severity and probability of occurrence) for successful risk communication provides empirical support for the recommendations in the emergency management literature. Whilst the emergency management literature recommends that directions to reduce the losses are explained, the social psychology literature goes further than this by outlining how a communication needs to cover a person’s ability to engage in behaviours to reduce the losses (i.e. self-efficacy) and the effectiveness of these behaviours (Duval and Mulilis, 1999).

Whilst including variables concerned with the event and the person has been supported by research findings, there were inconsistencies in how the variables and different levels of variables combine and impact on the effectiveness of a communication (Duval and Mulilis, 1999). It was with the inconsistencies in mind that the PrE model was developed (Duval and Duval, 1985; Duval and Mulilis, 1992, 1999; Mulilis and Duval, 1995, 1997). PrE was derived from the model of coping developed by

Lazarus and colleagues (Lazarus, 1966; Lazarus and Folkman, 1984). The model of coping suggests that when faced with the possibility of a harmful event, a person will undertake a cognitive appraisal and assess both the seriousness of the potential event and also their personal resources relevant to being able to manage the event. Based on the model of coping, PrE proposes that *“a person who appraises his or her resources as sufficient in quality and quantity relative to the magnitude of a particular threat will engage in more problem-focused coping [i.e. preparedness] activities than will a person who appraises personal resources as insufficient relative to the seriousness of the threat”* (Mulilis and Duval, 1995, p.1321). Research conducted with 135 students (Mulilis and Duval, 1995) and 112 homeowners (Duval and Mulilis, 1999) using earthquakes as the incident provides support for the model suggesting that communications are more likely to be effective in influencing the public to prepare for an earthquake when they incorporate both a person’s resources to deal with the incident and the severity of the threat. If a member of the public evaluates their resources as sufficient relative to the severity of the threat, increasing the level of threat will result in increased problem focused coping (Duval and Mulilis, 1999). Further research on the PrE model exploring tornado preparedness has also illustrated how in situations where there is high personal responsibility for preparedness, the effect on preparedness is greater (Mulilis et al., 2000). The public’s perceived responsibility for preparedness and how this influences whether they undertake preparedness actions is also explored below. Whilst the PrE model focuses on the psychology of negative threat appeals, the findings provide partial support for the recommended content (Mileti and Peek, 2002; Nathe, 2000; Nathe et al., 1999) that should be included in preparedness communications.

2.2.3 Communication channels for delivering preparedness information

A variety of communications channels (e.g. printed materials, television, radio) can be used to deliver preparedness messages to the public, however, not all channels will have the same effect on influencing the public’s preparedness. The Parkfield study outlined above analysed the impact that different communications channels have on preparedness, finding that a brochure had most impact on public perception and understanding of the earthquake prediction than any other channel (Mileti et al., 1992). The study also recommended that the public should receive written preparedness documents providing them with information that they can later refer to and that multiple communications channels should supplement written documents. The importance of using multiple communications channels to deliver preparedness information is also supported by research by Wood et al. (2011) and Tanaka (2005). A survey (Tanaka, 2005) of 371 people from Fukui (Japan) and 190 people from San Francisco Bay Area (California, USA) found that receiving information through a higher number of

communication channels resulted in a higher level of preparedness for earthquakes. The findings also showed that printed communications channels were more effective in preparing the public than broadcast channels (i.e. radio and television) (Tanaka, 2005).

In addition to traditional communications channels (i.e. printed materials), the literature has also examined alternative ways of providing the public with preparedness information. For example, Tanaka's (2005) study identified three different types of educational sources (i.e. communications channels); print, broadcast and meetings. Qualitative research undertaken by Becker et al. (2012) also identified three different types of information that people receive based on different types of communication channel; passive, interactive and experiential information. Passive information refers to preparedness information that is traditionally provided to the public through brochures, television and websites and is concerned with raising awareness and knowledge of hazards or preparedness. Interactive information involves interacting with other people through activities taking place in schools, the community, the workplace, or through training. Whilst interactive information is also concerned with raising awareness, it goes further by using the interactive discussion to assist people in understanding the consequences of an event. The interaction also enables people to build their skills in preparing and responding to an earthquake and resulted in people forming beliefs in their ability to prepare and respond. Studies by Ronan et al. (2001), Ballantyne et al. (2000) and Mileti and Fitzpatrick (1993) also provide support for interactive information delivered through school and community activities. Research by Ronan et al. (2001) found that children who participate in two or more education programmes learning about hazards are significantly more aware of protective behaviours than non-educated children and those participating in only one programme (Ronan et al., 2001). The potential to use community groups to provide the public with preparedness information has also been explored by Ballantyne et al. (2000) and Mileti and Fitzpatrick (1993). A survey of 405 people by Ballantyne et al. (2000) provides support for the use of community groups to prepare the public for volcanic hazards, finding that *"preparation is linked to prevailing sense of community. These data support the use of community empowerment and development programmes for hazard mitigation and preparation initiatives"* (p.38). Experiential information, the final type of information identified, was information gained from a person's own life experiences. This included both direct experience of a disaster and indirect experience gained from either observing or responding to a disaster or through experiencing an accident or working in emergency management. Similar to the other types of information, experiential information assisted people in understanding the consequences of disasters,

in building skills in preparedness and response and in developing beliefs about a disaster. The influence that experiencing a disaster has on public preparedness will be further examined below.

The next section outlines the existing literature on the target audience of risk communication which as highlighted below will determine the communications channels that should be used to provide information.

2.2.4 The target audience of preparedness communications

Mileti and Peek (2002) outline how *“it is important to recognize that the public is diverse, and thus information must be tailored to the needs of each group (Turner et., 1979)”* (p.134). The evidence discussed below supports the need to use different approaches to target different groups of the public.

A study investigating the preparedness of 925 members of the public residing in Sweden concluded that *“measures to increase people’s preparedness are more likely to be effective if they are selectively directed towards certain groups”* (Larsson and Enander, 1997, p.20). In their study, Larsson and Enander (1997) identified differences in preparedness between the genders and between different age groups. These differences suggest a need to develop different communications approaches for the different subgroups based on their level of preparedness.

The importance of emergency management research focused on vulnerable groups and identifying tailored preparedness approaches for those groups has also been highlighted by Tanaka (2005). Examples of those groups who may be particularly vulnerable in a disaster include: *“the aged and disabled people, their helpers, people without families, recently arrived immigrants, highly mobile people, residents living in single family units, and low-income groups”* (Tanaka, 2005, p. 220). Considering diverse and vulnerable groups of the public is particularly important as *“both the information people need in order to prepare and the resources they possess in order to carry out preparedness measures are unequally distributed throughout society”* (Tierney et al., 2001, p.29). In a study investigating the evacuation needs and beliefs of 139 older adults, Rosenkoetter et al. (2007) found that whilst disaster and preparedness information is available on many websites, the majority of their respondents did not have a computer. Vulnerable groups of the public such as these may require communications to be targeted to their particular needs. For example, Rosenkoetter et al. (2007) suggest recruiting volunteers to provide information in locations where older adults are likely to be present such as senior centres and to communicate information in newspapers and newsletters targeted at older adults. Mileti and Peek (2002) also provide a number of recommendations for

tailoring information to different groups including translating materials or writing in multiple languages to ensure non-native speakers are not ignored and using different communications materials to reach different cultural groups. Tanaka's (2005) study investigating earthquake preparedness in Fukui and San Francisco Bay Area highlighted how *"different approaches and information of disaster education are necessary for people to be motivated to take preparatory activities in different cultures"* (p.218). Whilst printed and broadcast information and meetings were necessary for preparedness in Fukui, in San Francisco Bay Area printed material was considered more accepted and suitable.

2.2.5 The effects of risk communication

Whilst the above sections highlighted research investigating the effects of the individual elements of risk communication (i.e. source), there has been limited research on the effectiveness of risk communication as a whole on influencing levels of public preparedness (Wood et al., 2011; Terpstra et al., 2009; Haynes et al., 2008; Nathe, 2000). The lack of an evidence-based integrated model of risk communication is highlighted by Wood et al. (2011) outlining how *"what is of critical importance to the nation, though absent, is an empirically validated model of actionable risk communication – one that facilitates action by the general public-that can frame education for public preparedness"* (p.3).

Whilst there is a lack of research on the effectiveness of risk communication as a whole, Morrow (2009) outlines how *"it is well acknowledged that information alone does not lead to action"* (p.29). This is supported by a study exploring tsunami preparedness which found that *"despite success in disseminating hazard information, levels of preparedness were recorded at low to moderate levels. The findings...emphasized...the need for additional strategies to augment existing programs"* (Johnston et al., 2005, p.183).

Studies predominantly identify low levels of public preparedness for both emergencies and mass evacuation (West and Orr, 2007; Ballantyne et al., 2000; Johnston et al., 2005; Blendon et al., 2007). For example, West and Orr (2007) found that despite a significant number of respondents living by the coast, only 28% of respondents knew the official evacuation route, 35% had prepared an emergency kit and 42% knew the location of their nearest emergency accommodation. The next section examines the factors that influence the likelihood of the public undertaking protective actions.

2.3 The protective action decision model (PADM) and factors influencing the public to prepare

The literature on the Protective Action Decision Model (PADM) (Figure 2.2) is reviewed as the model integrates the literature and research findings on risk communication and the factors that influence

public preparedness (Lindell and Perry, 2000). The PADM is *“a model of the factors that influence individual’s adoption of protective actions against natural and technological hazards and disasters”* (Lindell and Perry, 2004, p.45).

Predominantly used to explain public response to warnings, the model has been applied to account for long-term preparedness (Lindell and Perry, 2000, 2004). The PADM is used as a framework to examine the different factors, in addition to risk communication, that influence the likelihood of a person undertaking protective (i.e. preparedness) actions. Figure 2.2 illustrates how in addition to risk communication, the public receive information from environmental cues and the social context. However, as examined below, different characteristics of the receiver of information (e.g. disaster experience, personality characteristics and demographic characteristics) may influence the likelihood of them preparing. The PADM also includes five stages of decision making that incorporate the influence of factors including risk perception, efficacy attributes and resource attributes.

In addition to the literature directly investigating the PADM, the emergency management literature covering the influences on public preparedness will also be reviewed below. This shows that research studies have predominantly focused on earthquake preparedness and there have been inconsistent research findings.

Figure 2.2 The PADM – from Terpstra (2009, p.9) who adopted it from Lindell and Perry (2004, p.47)



2.3.1 Environmental cues, the social context and risk communication

Figure 2.2 highlights how prior to the decision to take protective action people have to be influenced by information from environmental cues, the social context or from risk communication (Lindell and Perry, 2004).

For long-term preparedness, environmental cues are concerned with a person observing other people's preparedness behaviours within their reference group. In this context, a reference group is the people that are considered significant and worthy of emulating by the person making the decision whether or not to prepare. Studies investigating preparedness for flooding (Dexter et al., 1979), volcanoes (Greene et al., 1981) and earthquakes (Farley et al., 1991) found that a person observing other people they know preparing made them more likely to undertake preparedness actions (Lindell and Perry, 2000). For example, Mileti and Darlington (1997) found that seeing others in the community prepare can influence the public to search for additional information. More recently, Wood et al. (2011) found that seeing others prepare was the strongest influence on whether people undertook preparedness actions.

Social context is concerned with two variables; *"friend and kinship networks and community networks"* (Lindell and Perry, 2004, p.139). The role of friend and kinship networks is similar to the interactive information outlined above as it focuses on the discussion and interaction that takes place between members within these networks. Discussing hazards with friend and kin networks has been found to influence risk perception (Lindell and Perry, 1993) and household preparedness (Mileti and O'Brien, 1992; Turner et al., 1986). Social context also considers the extent to which a person is integrated in community networks and communicates with members of community organisations (e.g. government agencies, voluntary associations). A model developed by Paton et al. (2008a,b, 2009) incorporating influences on preparedness examined the role that community participation and empowerment has on influencing preparedness intentions. A study by Paton (2008) examining how the different components of the model influence preparedness intentions highlighted the need for risk communication strategies to incorporate community engagement.

"The model highlights a need for [risk communication] to be based on community engagement and to encourage the discussion of hazard issues within established community forums (e.g. religious and ethnic groups, social action groups, neighbourhood watch and workplaces) in ways that empower community members to identify the implications of hazard activity for them and to facilitate their ability to confront these issues, including how to implement the solutions" (p.14).

The majority of people are likely to receive information from risk communication as environmental cues will not be present most of time (Lindell and Perry, 2004). The PADM includes four elements of

communication; information sources, information channels, message content and receiver characteristics. Whilst information source, information channels and message content were explored in detail above, for the PADM receiver characteristics is concerned with the characteristics of a person that makes them more likely to undertake preparedness activities. These characteristics and their influence on preparedness will now be examined.

Disaster experience

Research investigating earthquake preparedness has found that preparedness was directly related to the number of earthquakes that had been experienced (Russell et al., 1995) and the losses that an individual or people close to them experienced (Jackson, 1977, 1981; Turner et al., 1986). Earthquake preparedness was also indirectly affected by experiencing an earthquake viewed as frightening (Dooley et al., 1992). Whilst some studies have identified the positive influence that disaster experience has on risk perception and preparedness, there are inconsistent findings in the literature on the effect disaster experience has (Lindell and Perry, 2000). Lindell and Perry (2004) highlight a number of studies finding disaster experience to be weakly related or unrelated to preparedness. Tierney et al. (2001) also outline how there are conflicting findings in the literature and a great deal that is still unknown.

Johnston et al. (1999) investigated public perceptions of volcanic hazard in two communities in New Zealand before and after a volcanic eruption. A survey of approximately 100 residents in each community found that for one community despite increases in threat knowledge, risk perception and perceived preparedness there was a decrease in the preparedness activities undertaken. This finding is related to the concept of “*normalisation bias*” (Mileti and O’Brien, 1993) whereby “*people infer from an ability to cope with (objectively) minor eruption consequences a capability to deal with any future occurrence*” (Paton et al., 2008b, p.181). Thus, the public experiencing one disaster resulted in them perceiving themselves as more prepared than they actually were for future disasters.

Hazard knowledge

Higher levels of knowledge have been found to increase the adoption of preparedness measures (Turner et al., 1979; Perry et al., 1981; Perry et al., 1982b). More recently, a study on earthquake preparedness by Lindell and Whitney (2000) found that respondent’s perceptions of their own and their families’ hazard knowledge was significantly correlated with preparedness intentions and the actual adoption of preparedness behaviours.

Hazard salience

Hazard salience is argued to be a determinant of hazard knowledge and risk perception (Perry and Lindell, 1990a). It is included in the PADM as it used to explain why some people but not others prepare without having first received risk communication or environmental cues (Lindell and Perry, 2004). The influence of hazard salience is mostly assumed rather than having been studied (Lindell and Perry, 2004).

Research investigating hazard salience has examined whether high salience results in the public treating hazards as a personal concern. Whilst Farley (1998) found that people who were concerned about the risk of an earthquake were more likely to have higher levels of knowledge about the hazard, Russell et al. (1995) found that personal concern about earthquakes did not significantly predict the likelihood of someone undertaking preparedness actions.

Whilst not discussed in relation to the PADM, one reason a hazard may have low salience is due to low awareness. Auf Der Heide (1989) suggests that low awareness is one reason for the public's apathy towards preparedness. Related to low awareness is the issue of uncertainty. A survey of 925 people in Sweden found that the most popular reason for not preparing is uncertainty as respondents did not know what they should be preparing for (Larsson and Enander, 1997).

Personality characteristics

The influence of two personality characteristics are included in the PADM and are discussed by Lindell and Perry (2004); the personal protection responsibility and the locus of control.

The personal protection responsibility *"refers to people's beliefs about their own levels of responsibility for self-protection from a hazard"* (Lindell and Perry, 2004, p.156). Early research on personal protection responsibility by Jackson (1977, 1981) found that the majority of respondents believed that the responsibility for earthquakes lay with governments with only 10% of respondents believing that households had responsibility. However more recent research highlights how people are accepting more responsibility for their protection from disaster impacts (Lindell and Perry, 2000, 2004). For example, research on earthquake hazard adjustments by Lindell and Whitney (2000) found that respondents perceived themselves as significantly more responsible than officials for protecting themselves and their property. In contrast, a study by Terpstra and Gutteling (2008) investigating flood risk management in The Netherlands found that the 658 respondents *"regarded public administrations as being primarily responsible for preventing or mitigating damage to their possessions...while for*

disaster preparedness the average attitude reflected an equal division of responsibility” (p.560). Hence there are some subtle differences between the findings in relation to personal and state responsibility.

Whilst the public are accepting more responsibility for their preparedness, there are inconsistent findings on the influence that perceived responsibility has on preparedness. The study by Lindell and Whitney (2000) found a significant correlation between perceived responsibility and the adoption of earthquake hazard adjustments. However the study by Terpstra and Gutteling (2008) did not find any correlation between perceived responsibility and the adoption of hazard adjustments.

Perceived responsibility is also a variable in the PrE model. As outlined above, the PrE model proposes that in situations where a person appraises their resources as sufficient, both in quantity and quality, relative to the perceived magnitude of a threatening event, the person will undertake more problem-focused coping (e.g. preparing for a hazard) (Mulilis and Duval, 1995; Duval and Mulilis, 1999).

Research examining the PrE model has also identified that in situations where there is high personal responsibility for preparing, the effect on preparedness is greater (Duval and Mulilis, 1999; Mulilis and Duval, 1995; Mulilis et al., 2000). A study by Mulilis and Duval (1997) found that the effectiveness of a negative threat appeal in influencing preparedness depends on two factors; that a person believes their resources are sufficient to manage the consequences of an event and that they believe they are personally responsible for undertaking preparedness actions. Further research by Lalwani and Duval (2000) highlighted how people are unlikely to take responsibility for an issue such as earthquake preparedness unless they have sufficient resources to manage their response to the problem. In situations where respondents had high perceived responsibility but insufficient resources, responsibility was attributed to others.

Whilst research has investigated the influence of perceived responsibility, Lindell and Perry (2004) outline how *“much remains to be learned about this variable”* (p.156). They suggest that levels of personal protection responsibility may vary depending on the type of hazard. For example, people may perceive higher levels of personal protection responsibility for natural hazards that they are more familiar with and that are simpler to prepare for (Lindell and Perry, 2004). Paton et al. (2005) also highlight the need for further research on the role of personal responsibility.

The second personality characteristic discussed by Lindell and Perry (2004) is locus of control. An internal locus of control is concerned with an individual believing that they can control what happens to them (Lindell and Perry, 2004). In the context of emergency management, an external locus of control, termed fatalistic by Turner et al. (1986), is an individuals’ belief that regardless of the actions taken to

prepare they will be unable to protect themselves from a disaster (Lindell and Perry, 2004). Research focusing on the influence of locus of control has focused on earthquake preparedness and has found that it is related to hazard knowledge and perceived risk (Lindell and Perry, 2004). Studies have found that people that are higher in fatalism have less knowledge about earthquakes, believe that the risk of earthquakes is lower and undertake fewer actions to prepare for earthquakes (Simpson-Housley and Bradshaw, 1978; Turner et al., 1979; 1986; Farley et al., 1993). However, Lindell and Perry (2004) outline how there is insufficient research and a need for further research that includes measures of fatalism.

Demographic characteristics

Research examining the influence of demographic characteristics on preparedness is inconsistent with no definitive findings. Studies also predominantly focus on the adoption of seismic preparedness actions. Despite inconsistent findings, demographic characteristics of the public have been proven to influence the likelihood that particular groups of the public will undertake preparedness actions (Larsson and Enander, 1997; Lindell and Whitney, 2000; Lindell and Perry, 2000; 2004). Studies have investigated the influence of a wide variety of demographic characteristics including; *“sex, age, education, income...marital status, presence of dependents (school-age children or the aged), ethnicity...neighbourhood tenure, and home ownership”* (Lindell and Perry, 2000, p.478-479).

Research by Mileti and O’Brien (1992) found that earthquake adjustment adoption is only related to one demographic characteristic, female gender. This finding is supported by research undertaken by Terpstra and Lindell (2013) which found that among different demographic characteristics, female gender has the largest impact as females had higher risk perception and confidence in the effectiveness of flood hazard adjustments. Examining earthquake preparedness, Lindell and Whitney (2000) identified that *“females intended more adjustments and older respondents intended and actually adopted more adjustments”* (p.19-20). These findings on the influence of gender and age are partially supported by research examining the public’s preparedness for disasters, which found that although women and younger people have typically made less preparations than other groups they are more willing to do so (Larsson and Enander, 1997).

Lindell and Prater (2000) conducted survey research with 387 people from southern California and western Washington. Their study found that age (being older), income (higher incomes) and marital status (married being more likely) had significant effects on earthquake hazard adjustment. However, the positive influence that age has on the likelihood of an individual undertaking preparedness actions

for earthquakes was not supported by Edwards (1993). The survey of residents of Memphis, Tennessee found that white ethnicity, higher levels of education and income and having children at home were found to result in higher adoption of preparedness measures. The finding that the adoption of preparedness measures was more likely for people with white ethnicity than other ethnic groups was supported by Russell et al., (1995) and Mileti and Darlington (1997). Dooley et al. (1992) found that having children at home, marital status (being married), age and neighbourhood tenure (having lived at their current address longer) were positively correlated with adopting seismic hazard adjustments.

Research has also classified home ownership as a demographic characteristic (Lindell and Perry, 2000). Home ownership has been found to be positively related to seismic risk perception (Lindell and Prater, 2000) and seismic hazard adjustment (Russell et al., 1995). Research investigating the influence of home ownership on tornado preparedness found that house owners were more prepared than renters (Mulilis and Duval, 2000). The study by Lindell and Whitney (2000) found that *“those who live in apartments were less likely to intend to adopt or actually adopt seismic adjustments”* (p.19-20).

However, a review of 23 studies on households' adjustment to seismic hazards found that there are small correlations between demographic characteristics and hazard adjustment and these correlations are only statistically significant in very large samples (Lindell and Perry, 2000, 2004).

Despite the inconsistent research findings, it highlights the need to consider the target audience when developing communications and strategies to influence public preparedness (Larsson and Enander, 1997). For example, Lindell and Perry (2004) outline how *“with regard to hazard adjustment itself, the utility of demographic variables might lie primarily in identifying segments of the population that are differentially disposed to adopting hazard adjustments. Such information could be used to target the delivery of risk communication programs”* (p.163).

The above section has focused on how different characteristics of the receiver of risk communication information influences the likelihood of them undertaking actions to prepare for a hazard. The PADM proposes that the public receiving information from environmental cues, the social context and risk communication initiates three pre-decisional processes; *“reception of, attention to and comprehension of socially transmitted information”* (Lindell and Perry, 2004, p.49). For long term preparedness, the main source of information for the public will be risk communication. However, the public's attention to the information will be influenced by the degree to which they are expecting a hazard to occur, the competition for their attention and the intrusiveness of the information. Lindell and Perry (2004) outline how *“information about long-term hazard threats and hazard adjustments will also be*

comprehended to the degree that the risk communication messages are conveyed in language that risk area residents understand” (p.125). For example, the public may receive and have awareness of the risk communication but may not understand it if it is written in a technical or foreign language. Thus, when providing the public with risk communication, it is important to ensure that they are also able to understand it.

Once the pre-decisional processes have been successfully completed, a person will go through five stages of decision making (Lindell and Perry, 2004). Each stage and the influences on a person’s decision to undertake preparedness actions is examined below.

2.3.2 The decision stages of the PADM

Risk identification

The PADM proposes that the decision about how to respond to a hazard starts with risk identification (Lindell and Perry, 2004). As outlined above, the PADM was originally developed to explain public response to warnings and it is for this purpose that risk identification is more relevant. However, for long term preparedness, risk identification can be triggered by environmental cues or messages received from risk communicators.

Risk assessment

Risk identification is followed by risk assessment defined as *“the process of determining the likely personal consequences that the disaster or hazard could cause”* (Lindell and Perry, 2004, p.51). This stage is also referred to as risk perception which has been examined as an influence on the public’s decision to prepare. However as outlined below, there has been inconsistent findings on its influence.

Whilst earlier research suggested a link between risk perception and the adoption of hazard adjustments (Turner et al., 1986; Mileti and Fitzpatrick, 1993), more recent studies have found a weak or no correlation (Lindell and Prater, 2000; Lindell and Whitney, 2000). However, the different findings on the influence that risk perception has may be a result of the methodological differences in the definition and measurement of risk perception (Lindell and Perry, 2000). Lindell and Perry (2004) also highlight the longer time-frame related to adopting hazard adjustments and how this can result in other variables (e.g. recent hazard experience) influencing a person’s risk perception and ultimately their adoption of adjustments.

Related to risk perception is the concept of *“unrealistic optimism bias”* (Paton et al., 2008b; Weinstein and Klein, 1996) whereby the public perceive themselves as less vulnerable or more able to cope than

people around them. Research examining preparedness for two hurricanes conducted by Sattler et al. (2000) found evidence that optimism bias influenced respondent's perceptions of the two hurricanes.

"In both studies, almost 80% of the participants believed that the hurricane would strike and cause moderate to severe property damage to their homes, yet almost 80% believed that the building in which they lived was safe and could withstand a hurricane. Although close to half of the participants were gathering supplies and making other preparation efforts, many also denied the severity of the storm. These findings are consistent with past research" (p.1415).

If the public perceive themselves as less at risk from the impacts of a disaster than others around them, this may result in them transferring the risk to others in the community (Paton et al., 2008b) and thus not undertake preparedness actions.

Protective action search

Once an individual has identified that the threat is real and that there is a level of unacceptable risk, the process of risk reduction begins (Lindell and Perry, 2004). The first step of this process, protective action search, involves identifying the actions that can reduce the level of risk. To ensure that an individual successfully passes through this stage, Lindell and Perry (2004) outline how EMAs should include at least one hazard adjustment in their risk communication.

Protective action assessment

This refers to a person moving to the protective action assessment after at least one protective action has been identified to reduce the level of risk. It involves evaluating the possible alternative actions, comparing them to the consequences of doing nothing and selecting the actions that are most suitable for the situation (Lindell and Perry, 2004). There are two categories of variable to consider when undertaking the protective action assessment; efficacy attributes and resource requirements (Lindell and Perry, 2000). Efficacy attributes are concerned with how an individual perceives the effectiveness of hazard adjustments for reducing the negative consequences of an event, whereas resource requirements are concerned with *"the financial cost, time and effort, specialized knowledge and skill, specialized tools and equipment, and cooperation from others"* that are required to undertake the hazard adjustment (Lindell and Perry, 2004).

In terms of efficacy attributes, research examining the PrE model outlined above identified that higher levels of response efficacy resulted in increased earthquake preparedness behaviours (Mulilis and Duval, 1995). In another study investigating earthquake hazard adjustment adoption, Lindell and Whitney investigated three efficacy attributes; *"perceived efficacy for protecting persons, perceived efficacy for protecting property, and utility for purposes other than earthquake protection"* (Lindell and

Whitney, 2000, p.21). The research found that all three efficacy attributes were significantly correlated with both adjustment intentions and actual adoption. A study applying the PADM to explain citizens flood preparedness intentions in the Netherlands also investigated the same three efficacy attributes as Lindell and Whitney (2000). The study by Terpstra and Lindell (2013) found that the best predictor of adoption intentions was efficacy for protecting persons.

Related to this is research by Paton et al. (2008) on the influence that outcome expectancy has on preparedness intentions for volcanic hazards. Negative and positive outcome expectancy were included in a model outlining the social predictors of an individual's intention to prepare. Research testing the model found that *"negative outcome expectancy (people believe that volcanic hazard consequences are so destructive or catastrophic as to render personal actions futile) predicted a reduction in the likelihood that people would formulate preparatory intentions"* (p.186). The public believing that the benefits of preparing outweighed the costs of preparing and that the outcome of preparing is achievable (i.e. positive outcome expectancy) also positively influenced preparedness intentions.

In terms of how resource requirements influence the adoption of hazard adjustments, Lindell and Perry (2004) highlight how, other than for financial cost, there has been little research in this area. However, studies have predominantly focused on financial cost indirectly by examining the influence that income has on hazard adjustment (Lindell and Perry, 2004). Similar to several of the other influences on hazard adjustment, Perry and Lindell (2004) highlight the inconsistent and contradictory literature on the influence that financial cost has on preparedness. Qualitative research by Larsson and Enander (1997) found that not wanting to spend time or money were reasons provided by respondents for not preparing. The study found that respondents undertook the preparedness activities that required the least time and money (i.e. purchasing a first aid kit) rather than those requiring more commitment (i.e. joining voluntary organisations).

Protective action implementation

The fifth stage of the decision making process, protective action implementation, occurs when all the questions about risk reduction have been addressed satisfactorily (Lindell and Perry, 2004). This means that people at risk have identified that they need to take action and have identified at least one effective hazard adjustment that will be feasible considering available resources. However, the low levels of preparedness outlined above suggests that many people do not reach this stage.

2.3.3 Information search (information needs assessment, communication action assessment and communication action implementation)

According to the model as individuals are progressing through the five stages of the protective action decision process, they are responding to the information that is available. The three boxes on the right hand side of Figure 2.2 are concerned with the process of information search (Lindell and Perry, 2004). The first stage, the information needs assessment, is recognising that there is insufficient information to progress further in the protective action decision process. This will result in an individual seeking further information.

After the need to seek further information has been identified, an individual undertakes a communication action assessment to identify where (the source of information) and how (the information channel) they will access the information needed (Lindell and Perry, 2004). However, Lindell and Perry (2004) outline how for long-term hazard adjustment, individuals are more likely to passively monitor their normal sources of information and communications channels for information.

Communication action implementation, the third stage of information search, is concerned with whether an individual needs the information now. For long-term hazard adjustment, people do not believe that they need the information now and return to everyday activities and in some cases passive monitoring (Lindell and Perry, 2004).

Whilst the PADM, integrates the existing literature on risk communication and the factors that influence an individual's decision to undertake preparedness actions, Lindell and Perry (2004) outline how not all relationships among variables in the PADM have been statistically tested. They also outline how;

“The second caution regarding the empirical base is that there remain significant gaps in the research literature. Some aspects of hazard adjustment adoption have not been studied at all, and where findings have been reported, many have not been replicated. Consequently, the level of confidence that can be placed in many empirical conclusions is lower than is desirable” (Lindell and Perry, 2004, p.123).

2.3.4 Methodological limitations

The methodological limitations associated with the PADM have been outlined above. However, criticisms have also been made of both areas of emergency management literature. As outlined in Chapter 1, Paton (2003) and Tierney et al., (2001) highlight the need for a more thorough and standardised conceptualisation of preparedness and how it is assessed.

“Even though there has been movement toward standardizing the measurement of household preparedness, the theoretical variables that have been examined in studies on preparedness, the operationalization of those variables, and the research designs still vary considerably. Even more important, generalizing from existing studies remains problematic because research on preparedness has been undertaken over a range of different hazard contexts...while this profusion of approaches has yielded a wealth of new and useful ideas, the idiosyncratic nature of many studies and their linkage to particular hazard contexts leaves a good deal of uncertainty about their replicability and generalizability” (Tierney et al., 2001, p.34).

A related criticism has been made by Larsson and Enander (1997) who question the validity of research on public preparedness. They argue that *“the selection of indicators has generally not been related to empirically-based models of the general public’s conception of the area. Consequently, one cannot be sure the attributes investigated are the most important with regard to disaster preparation”* (p.12).

There are also few studies investigating preparedness for multiple hazards (Lindell and Hwang, 2008; Tierney et al., 2001). Wood et al. (2011) outline how whilst research has investigated preparedness for one hazard such as tsunamis, floods or hurricanes, the majority of research has focused on earthquakes with research examining preparedness for terrorism being more recent (Wood et al., 2011). The multiple disasters that occurred in Japan in 2011 highlight the need for further studies on multiple hazards (Norio et al., 2011).

The next section introduces the literature on an approach to public preparedness that can incorporate the two areas of literature outlined above.

2.4 Social Marketing

The final area of literature to be reviewed and that has recently been applied to influencing public preparedness behaviours is social marketing. Social marketing is not a theory in itself but similar to risk communication draws on knowledge from other disciplines including *“psychology, sociology, anthropology and communications theory”* in order to understand how behaviour can be influenced (Stead et al., 2007; p.127, Gordon et al., 2006; Kotler and Zaltman, 1971). Established in the field of marketing in 1971, social marketing is increasingly considered to have two ‘parents’ that are both primarily concerned with influencing behaviour: marketing and the social sciences (Truss et al., 2010).

Andreasen (1994) defines social marketing as *“the adaptation of commercial marketing technologies to programs designed to influence voluntary behaviour of target audiences to improve their personal welfare and that of the society of which they are part”* (p.110). Six benchmarks (Table 2.1) are

identified by Andreasen (2002) for identifying whether a behaviour change approach can legitimately be called social marketing.

Table 2.1 The six benchmarks of social marketing (adapted from Andreasen, 2002)

1. Behaviour change goals	Behaviour change is the benchmark used for designing and evaluating interventions
2. Audience research	Audience research is conducted to (a) understand the target audience (i.e., formative research) (b) pre-test elements of an intervention before they are rolled-out (c) monitor interventions as they are rolled out
3. Audience segmentation	Target audiences are segmented to maximise scarce resources
4. Exchange	Attractive and motivational exchanges are created with the target audience
5. The four Ps of the traditional marketing mix	Attractive benefit packages (products) are created Costs (price) are minimized The exchange is convenient and easy (place) Messages are communicated through media relevant to-and preferred by-target audiences (promotion)
6. Competition	Careful attention is paid to the competition faced by the desired behaviour

Social marketing has traditionally been applied to public health however in recent years its application has been widened and extended to emergency management contexts where it has been used effectively to influence the public's preparedness for emergencies in Rhode Island (US) (Marshall et al., 2007), Canada (Kotler and Lee, 2008) and Central Vietnam (Ramaprasad, 2005). In Rhode Island, the social marketing approach resulted in 10% of the adult population adopting one or more preparedness behaviours (Marshall et al., 2007). The appropriateness of social marketing for influencing emergency preparedness behaviours is highlighted by Guion et al., (2007) who outline how *"through culturally sensitive market research, careful marketing segmentation and targeting, and scrupulous pretesting of marketing programs, social marketing has the potential to address the individual differences...that affect people's perceptions of disaster risks and their responses to risk"* (p.26).

This section will first examine social marketing's focus on behaviour change and its widening application before moving onto review the literature on the benchmarks of social marketing relevant to public preparedness for emergencies. It will also examine how social marketing has been used to responsabilize the public for different social issues. The section concludes by discussing the ethical issues associated with the application of social marketing.

2.4.1 Social marketing for behaviour change

For an approach to be deemed as social marketing, Andreasen (1994) proposes that programs must meet three of the criteria outlined in his definition provided above. The first is that approaches should use commercial marketing technologies such as “*consumer orientated market research, segmentation and targeting, and the marketing mix*” (Stead et al., 2007, p.127). Social marketing programs should also be designed to influence voluntary behaviour change. Although behaviour change is the primary goal of social marketing, Andreasen (1995) acknowledges that in high involvement situations behaviour change can take a long time and in the short term the focus can be on knowledge or attitude change. The final criterion is that in contrast to commercial marketing, social marketing is concerned with influencing behaviour change in order to primarily benefit individuals and society and not the marketing organisation (Andreasen, 1994).

Although the primary beneficiaries of social marketing approaches are individuals and society, social marketing may be applied to influence both the public’s (downstream social marketing) and policy makers (upstream social marketing) behaviours. This is in contrast to the first two areas of literature outlined above that predominantly focus on influencing the public’s preparedness behaviours.

In its earlier conceptualization, social marketing focused on downstream applications to influence the public’s behaviour. However, Andreasen (2006) highlights calls for social marketing to broaden its focus and application to target the upstream behaviours of policy makers. The call outlined below was made by Hastings and Donovan (2002) in *Social Marketing Quarterly*:

“We now call collectively for social marketing to embrace a broader perspective that encompasses not just individual behaviour, but also the social and physical determinants of that behaviour....this broadening still involves behaviour change, but among those who make policy and legislative decisions on behalf of groups, corporations, and governments, as well as individual citizens” (p.4).

Thus, there is a need for behaviour change approaches to consider both upstream and downstream perspectives. However, whilst there have been calls for social marketing to broaden its focus to upstream government and policy makers, Wymer (2011) outlines how the social marketing literature places little attention on understanding or influencing upstream behaviour change.

2.4.2 Social marketing’s applications

Social marketing has traditionally been adopted to change public health related behaviours (Grier and Bryant, 2005). A systematic review of the effectiveness of social marketing in influencing smoking,

alcohol, illicit drug and physical activity related behaviours found that social marketing *“can be effective across a range of behaviours, with a range of target groups, in different settings and can work upstream as well as with individuals”* (Stead et al., 2006, p.183).

The application of social marketing to address different social issues is also increasing internationally. Hastings (2007) discusses case studies demonstrating social marketing’s application in the UK, the USA, New Zealand, Canada, India and Australia. In 2012, the European Social Marketing Association (ESMA) was launched focusing on social marketing research, teaching and practice across Europe (<http://www.europeansocialmarketing.org/about-us/>).

The growing adoption of social marketing by governments is reflected by the UK Government’s adoption of social marketing to change health related behaviours. The 2004 ‘Choosing Health’ White Paper outlined how social marketing *“could be used to build public awareness and change behaviour, making behaviour that harms less attractive and encouraging behaviour that builds health”* (Department of Health, 2004, p.21). The White Paper was followed by the establishment of the National Social Marketing Centre (NSMC) in 2006 as a collaborative partnership between the Department of Health and the National Consumer Council (Gordon and Moodie, 2009). The NSMC aim *“to maximize the effectiveness of behavior change programmes...through strategic analysis, advice, support and training across all levels of the social marketing process”* (<http://thensmc.com/content/about-us>).

The NSMC website outlines that they provide advice to various International government departments including the US based Centers for Disease Control and Prevention (CDC) and the UK based Cabinet Office and Department for Environment, Food and Rural Affairs (DEFRA). Each of these government departments has responsibilities for preparing their public for emergencies including mass evacuation. Coppola and Maloney (2009) also highlight how US government agencies are increasingly using social marketing to change public behaviour.

“In the past three decades, a number of nonprofit and pro-social sectors have begun to use marketing tools and techniques to circulate social change strategies more effectively. These strategies have guided the design and implementation of campaigns and interventions of successful governmental agencies and organisations such as...CDC., the U.S. Environmental Protection Agency (EPA), the National Institutes of Health (NIH), the U.S. Coast Guard, and the National Traffic Safety Administration (NTSA)” (p.9).

More recently, the 2011 UK Department of Health publication; *“Changing Behaviour, Improving Outcomes: A New Social Marketing Strategy for Public Health”* outlined the adoption of social

marketing to improve the public's health related behaviour. The publication also highlighted the success of Department of Health and local NHS social marketing campaigns targeting smoking (Smokefree), stroke (FAST) and obesity (Change4Life) (Department of Health, 2011). These campaigns and the case studies featured on the NSMC website include many examples of how the UK Government has effectively used social marketing to influence their public's behaviour.

In recent years, social marketing's application has widened beyond the traditional area of public health. Social marketing has been applied to influence behaviours related to alcohol impaired driving crashes (Rothschild et al., 2006), gambling (Gordon and Moodie, 2009) and sustainability (McKenzie-Mohr, 2000). As outlined above, social marketing can and has been applied effectively to influence the public's preparedness for emergencies.

2.4.3 Social marketing's relevance for evacuation preparedness

This section will use Andreasen's six benchmarks of social marketing (Table 2.1) to explore its application for influencing the public to prepare for mass evacuation.

2.4.3.1 Behaviour change goals

The primary goal of social marketing is voluntary behaviour change (Andreasen, 1994). Although social marketing is not a theory in itself, an additional "seventh" benchmark of social marketing proposed by the NSMC is the extensive use of behavioural theory (French and Blair-Stevens, 2006). Social marketing draws on a number of behaviour change theories as highlighted by Gordon (2011) and illustrated in Appendix 1.

Adopting a social marketing approach, the three emergency preparedness behaviours Rhode Island Department of Health wanted their public to adopt were to; make an emergency kit, make a plan to stay in contact with family and neighbours and identify how to stay informed about emergency instructions (Marshall et al., 2007). Similarly, Public Safety Canada's social marketing approach to emergency preparedness focused on raising public awareness and increasing the number of Canadians with both a family emergency plan and a 72-hour emergency kit (Kotler and Lee, 2008). A social marketing approach to disaster preparedness in Central Vietnam focused on creating awareness and understanding and an intention to act due to the short duration of the campaign (i.e. three months) (Ramaprasad, 2005). However, the author acknowledged that a limitation of the approach was the lack of behavioural objectives set. One of the first tasks when adopting a social marketing approach to

behaviour change is to set behavioural objectives, allowing the effectiveness of the approach to be evaluated (Grier and Bryant, 2005).

As outlined above, there have been calls for social marketing to focus on behaviour change on two levels; downstream and upstream. Guion et al., (2007) highlight how *“to achieve effective preparedness, behavioural changes on the part of both residents in the disaster area and emergency managers are essential. In this regard, social marketing has great potential for improving preparedness”* (p.25-26). Whilst the two areas of literature outlined above focus on downstream (i.e. public) behaviour change, social marketing focuses on both upstream and downstream behaviour. As part of their social marketing approach to emergency preparedness, Public Safety Canada also developed staff training seminars for 380,700 government employees and invited 307 members of Parliament to champion the approach to their constituencies (Kotler and Lee, 2008).

2.4.3.2 Audience research

In contrast to the existing public preparedness approaches outlined above, social marketing approaches incorporate *“bottom-up”* research as through the use of audience research the strategy is designed with the audience’s *“wants and needs”* in mind (Marshall et al., 2007, p.49). Audience research may be used at the beginning, during or after the implementation of the social marketing approach. Public Safety Canada conducted research before their campaign to measure the level of personal emergency preparedness (Kotler and Lee, 2008). The research identified low to moderate levels of personal preparedness with 33% of Canadians having prepared a family emergency plan and 32% an emergency kit.

Adopting a social marketing approach to influence the emergency preparedness behaviours of the public in Rhode Island, Marshall et al. (2007) conducted formative research to understand the public’s information needs and their preferences for receiving information. Qualitative research was conducted with both Rhode Island residents from different age groups and racial/ethnic groups and staff of community based agencies to understand the varying information needs across different groups of the public (e.g. disabled individuals). Supporting the literature on risk communication, the research highlighted a preference for written information. However, for vulnerable populations information was typically accessed through electronic media or word-of-mouth. The research findings also highlighted that the translation of emergency information from English into other languages was poor. Evaluative research found that approximately 10% of the Rhode Island population changed their behaviour and adopted at least one preparedness behaviour. *“The evaluation results [also] suggest that using the*

formative research to design the product made a real difference in the public's behavioural response" (Marshall et al., 2007, p.60).

2.4.3.3 Target audience segmentation

Segmenting the target audience is concerned with recognizing that not all members of the public should be targeted in the same way. This is consistent with both areas of the emergency management literature examined above. The need for different approaches to prepare different groups of the public is highlighted by Norio et al. (2011). Before the 2011 disasters in Japan, evacuation drills were regularly held in local communities however these did not prepare all groups of the public as the evacuation centres were inaccessible to old people.

The public may also perceive the costs and benefits of preparing for mass evacuation differently and need to be targeted in different ways (Guion et al., 2007). The segmentation strategies used in existing social marketing approaches to emergency preparedness include demographic (i.e. producing communications in different languages) (Marshall et al., 2007) and geographic (i.e. targeting populations in higher risk locations) (Ramaprasad, 2005). Guion et al. (2007) suggest that preparedness should be promoted at different levels of sophistication for those at different stages of the behaviour change process. This may be achieved by using the stages of change behavioural model (Prochaska and DiClemente, 2005) as outlined in the appendix.

2.4.3.4 Exchange

The benchmark of exchange is related to exchange theory as used in commercial marketing (Bagozzi, 1975). The aim of social marketing is to create *"attractive exchanges that encourage behavior (the benefits are so compelling and the costs so minimal that everyone will comply)"* (Andreasen, 2002, p.7). In the context of mass evacuation preparedness, in exchange for the benefits of being prepared for mass evacuation, the public must pay the associated price (costs) (Guion et al., 2007).

Stead et al. (2007) suggest that for behaviour change to occur there must be clear benefits. The benefits of the public being prepared for mass evacuation are clear (e.g. life-saving actions). However, it is unclear when (if ever) the public will receive this benefit. In comparison to commercial marketing, social marketing also faces the difficulty of selling benefits that may never be realized or may never want to be realized (Hastings and Saren, 2003).

Preparing for mass evacuation may cost the public time (e.g. searching for information), financially (e.g. purchasing an emergency kit) and psychologically (e.g. fear arousal). As outlined above, the cost of preparing is also considered in the PADM in terms of the influence that resource requirements has on the public undertaking protective actions. The time and financial costs of preparing for emergencies were also highlighted above as the reason why the public do not prepare (Larsson and Enander, 1997). Related to the concept of segmentation outlined above, the cost of preparing for mass evacuation may be higher for particular groups of the public for example those with low incomes or limited time. A social marketing approach aims to minimize the cost of the behaviour change. In their social marketing approach to emergency preparedness, Public Safety Canada attempted to reduce the time costs of preparing by selling ready-made emergency kits and by including templates for creating family plans on their website (Kotler and Lee, 2008).

2.4.3.5 The marketing mix

Unlike the approaches outlined above that focus predominantly on the design of risk communication to influence the public to prepare, the social marketing strategy considers the four P's of marketing through the creation of products/services, reducing the cost (price), having a convenient exchange (place) and by sending messages through preferred communication channels (promotion) (Andreasen, 2002). Their application as a strategy that EMAs may use to prepare their public for mass evacuation will now be discussed.

Product

A product includes three layers: the core product (benefits of preparing), the actual product (behaviours the public can perform to prepare) and the augmented product (any tangible goods or services that facilitate the behaviour of preparing) (Kotler, Roberto and Lee, 2002; McCormack Brown, 2006). Examples of augmented products introduced by Public Safety Canada to prepare their public for emergencies include a website, free telephone number, family preparedness guide and ready-made emergency kits (Kotler and Lee, 2008).

Price

The concept of price is related to exchange outlined above and minimizing the time, financial and psychological costs of preparing. To prepare for mass evacuation, the public have to pay the costs of performing the behaviour in the short term. Rothschild (2010) outlines how, *"inspiring people to engage in behavior with long-term benefits or short-term costs when competitive offerings promise instant gratification is difficult"* (p.4). There are additional issues with price related to emergency

management contexts as the gratification is couched in a disaster so unthinkable that members of the public may not want to receive the benefit of being prepared.

Place

A consideration of place involves identifying the accessible locations where the behaviour can be performed (Andreasen, 1994) and where access can be provided to products and services (Kotler and Lee, 2008). Grier and Bryant (2005) suggest the use of research to identify the public's "*life path points*", the places that are routinely visited (p.323). As outlined in the emergency management literature, places such as community groups and schools may be used to disseminate preparedness information to the public. However, there may be groups of the public who lack "life path points" and that have no social network. These groups present a challenge for EMAs.

Promotion

Promotion can be the most visible and considered of the four P's (Grier and Bryant, 2005) as it involves the selection of messages that are sent to the public via communication channels preferred by the target audience (Andreasen, 2002). The findings from the two areas of literature examined above can be used to inform the mass evacuation preparedness promotional strategy. For example, different groups of the public such as those who do not speak the national language or the elderly may require messages and communications channels to be tailored to their specific needs.

2.4.3.6 Competition to the behaviour change

The final suggested benchmark of a social marketing approach is recognizing that behaviour change comes with competition (Andreasen, 2002) and with most incentives to change, there is an incentive not to. For evacuation preparedness, the competition is also with other social marketing campaigns that vie for the public's attention and the ultimate competition is with the public's response of "*do nothing*" (Kotler and Lee, 2008, p.56).

2.4.4 Transferring responsibility using social marketing

As outlined above, perceived responsibility for preparedness can positively influence the public to prepare. Social marketing has been discussed as a tool government is increasingly using to make the public feel responsible for their health, well-being and a wide range of social risks (Raftopoulou and Hogg; 2010; Moor, 2011). A study analysing a UK Government sponsored social marketing campaign targeting benefit fraud highlighted the UK Government's increasing use of strategies that responsabilize the public.

“The appeal made to citizens to contribute to the solution of a social issue can also be related to a shift towards a neo-liberal logic and mode of governing, which implies an increased sense of individual responsibility. Thus, as Rose (1996) suggests, citizens are encouraged to self-regulate their behaviour and to become self-sufficient” (Raftopoulou and Hogg, 2010, p.1218).

Raftopoulou and Hogg (2010) also outline how the UK government run social marketing campaigns *“constitute part of the tools of governance. Such campaigns not only aim to convince citizens of the deliverability of particular policies but also work to create social norms through endorsing particular social behaviours whilst condemning others”* (p.1220). The application of social marketing to encourage the public to self-monitor and view their health and well-being as their own personal responsibility is also suggested by Moor (2011). Thus, social marketing may be used to influence the public to responsabilize themselves for a wide variety of social issues including their preparedness for mass evacuation.

2.4.5 A critique of social marketing

Due to its limited application in influencing the public to prepare for mass evacuation, it is important to explore the ethical implications of applying social marketing to influence public behaviour. This section will now examine these issues.

Social marketing has faced criticism based on the particular power issues that the approach reinforces (Raftopoulou and Hogg, 2010). It has been argued that *“social marketing could ultimately operate as a form of thought control by the economically powerful”* (Laczniak et al., 1979, p.32). O’Shaughnessy (1996) argues that the areas that are socially marketed are set by government and public bodies and are not the result of an objective assessment. It has been suggested that government’s *“identification of the individual and social welfare to serve as the aim of social marketing may be skewed”* (Brenkert, 2008, p.213). Thus, government may identify that personal preparedness for mass evacuation is important however the public themselves may not share this view. In many instances, social marketing approaches target behaviour change where there is unmet public demand (Buchanan et al., 1994). Brenkert (2002) argues how *“simply because something is in a person’s best interests, it does not follow that someone else (or the government) may impose it on them”* (p.19).

Criticism has also been levelled at social marketing for focusing predominantly on individual behaviour change (downstream social marketing) and not on the social and policy environment that may determine an individual’s behaviour (upstream social marketing) (Goldberg, 1995; Brenkert, 2002). Raftopoulou and Hogg (2010) highlight how *“social marketing has been accused of holding the individual responsible for behaviour change, instead of looking at institutional factors that determine his*

or her behaviour” (p.1211). Moor (2011) further outlines how questions have been raised about “*how far social marketing engages with issues of social and political context, how it understands cause and effect, and the position it adopts, implicitly or explicitly, on the location of responsibility for social problems*” (p.303).

The Government’s increasing use of a responsabilization strategy also assumes that the public are able to take responsibility for different social issues. In a discussion of the use of responsabilization strategies in public health contexts, Hoek and Jones (2011) suggest that these types of strategies make a number of assumptions.

“Individual responsibility arguments also make fundamental assumptions about the information available to consumers, its accuracy and quality, the ease with which they can access and use it...Furthermore, the myth of individual responsibility assumes consumers understand the information provided and are able to review and evaluate this” (p.37).

It can be suggested that individual responsibility strategies also assume that the public are able to act on the information provided by government. There may be members of the public who are unable to prepare for mass evacuation due to a variety of factors. For example, members of the public with low incomes may be unable to afford the resources that would be included in an emergency evacuation kit. There may be instances where vulnerable individuals are unable to take responsibility for their own preparedness and the government need to assume responsibility on their behalf. Upstream social marketing could be used to target policymakers to introduce regulations concerning vulnerable person’s preparedness for mass evacuation.

An additional concern that has been raised is over social marketing’s use of a segmentation strategy to determine who is targeted with a social marketing intervention. Brenkert (2002) outlines how a segmentation strategy “*may exclude certain groups that...need help but are not selected to be part of the group to be addressed*” (p.21). Thus, using a segmentation strategy may result in groups of the public that need to be prepared for mass evacuation being excluded from EMA approaches.

2.5 Examining the three areas of literature to develop the research questions

This section will critically examine the three strands of literature outlined above to identify the areas that are not currently addressed. It will outline the development of four research questions that aim to address these areas.

2.5.1 Public versus EMA perspectives

Paton et al. (2008a) and O'Brien (2008) call for the public and EMAs to have complementary roles in emergency planning. However, as the three areas of literature outlined above focus predominantly on the public's perspective of preparedness, little is known about institutional roles and perspectives of preparing the public.

All three areas of literature typically neglect EMA perspectives of public preparedness, despite it often being their responsibility to develop and implement the preparedness strategy. Dyer (1999) highlights how *"the disaster literature has been dominated by a focus on community and individual perspectives, but it has failed to take institutional perspectives and responses into account"* (Baker, 2009, p.120). Tierney et al. (2001) highlight the absence of research on EMA approaches to emergency preparedness and why particular strategies are selected.

"Although the disaster literature is replete with recommendations on how best to undertake disaster planning...these recommendations have largely not been followed up by systematic research. For example, we are unsure about the extent to which emergency planners and disaster managers either know or agree with these principles. Additionally, we have very little information on the extent to which recommendations on how best to prepare for disasters have actually informed local planning efforts" (Tierney et al., 2001, p.78).

As EMAs typically have responsibility for public education and disseminating preparedness messages (Guion et al, 2007), it is important to understand their perspective and identify how they are preparing the public. As outlined by Tierney et al. (2001) *"it is extremely important to understand which households prepare for disasters and why. But those questions are equally relevant for organizations, communities, and higher government levels"* (p.79).

Emergency management scholars have also highlighted a lack of cross-national research and research focusing on multiple hazards. Tierney et al. (2001) calls for more national and cross-national research as there is an absence of research comparing national government policies and practices.

This section has identified an absence of literature on how governments and institutions influence the public to prepare. To address the absence of research in this area, this thesis will address the following research question;

1. *How and why do EMAs influence the public to prepare for mass evacuation?*

Addressing this research question will contribute to the existing literature on public preparedness by providing an institutional and cross-national perspective of the practices and processes used by EMAs

to influence the public to prepare. Knowledge of the upstream context and the actual practices and processes used will inform further research on public preparedness in both the emergency management and social marketing literature. Furthermore, this research will also contribute to a more thorough conceptualisation of public preparedness based on the perspective of the EMAs responsible for planning, preparing and responding to the mass evacuation. This research will also add to the existing literature and contribute to knowledge by providing an understanding of how EMAs' approaches to public preparedness vary across different hazard contexts and across multiple countries. It will seek to provide an understanding of the different factors that influence how EMAs influence their public to prepare for mass evacuation in different contexts.

2.5.2 The responsibility for preparedness

The literature outlined above highlights how in recent years, the public are accepting more responsibility for their preparedness (Lindell and Whitney, 2000; Terpstra and Gutteling, 2008). Despite the public accepting more responsibility, levels of public preparedness remain low (West and Orr, 2007; Ballantyne et al., 2000; Johnston et al., 2005; Blendon et al., 2007). Both the emergency management and social marketing literature examined above cover the concept of responsibility. However in both areas of literature there is limited research on the role that responsibility has. For example, Lindell and Perry (2004) suggest that there is still a lot to learn about the influence of perceived responsibility on preparedness due to the small number of studies and inconsistent findings. The literature applying social marketing to public preparedness does not discuss responsibility and there is limited literature on social marketing and the concept of responsibility. Thus, both the emergency management and social marketing literature highlight the need for further research on the concept of responsibility.

Emergency management studies also typically examine the influence of perceived responsibility from the public's perspective. Despite EMAs having a responsibility to ensure their public are prepared for different types of hazard (Somers and Svara, 2009), there is a lack of research from the EMA (i.e. upstream) perspective on the distribution of responsibility for public preparedness. To address this gap, this research will investigate;

2. How do EMAs distribute the responsibility for public preparedness?

Addressing this question will contribute to knowledge by providing an understanding of the practices and processes EMAs use to distribute the responsibility for public preparedness. Furthermore, this

research will also provide an understanding of the implications of distributing responsibility across a variety of actors.

2.5.3 The different elements of the preparedness strategy

This section examines the three areas of literature in terms of the different elements that are considered in the development of a strategy to influence the public to undertake preparedness actions.

2.5.3.1 Aims of the approaches

Risk communication and social marketing have similar aims. As outlined above, the goal of risk communication is to increase knowledge, influence public behaviour and to manage risk at a community level (Rohrmann, 1998). Although social marketing also focuses on knowledge, increasing knowledge is only a short term goal as the primary focus is on influencing behaviour change. Whilst there has been limited research on the effectiveness of risk communication in influencing levels of public preparedness, the effectiveness of social marketing approaches are gauged by setting objectives in the early stages (Grier and Bryant, 2005).

The PADM aims to explain the different factors that influence the public to undertake protective actions. Whilst the PADM can be used to inform the design of risk communication and social marketing approaches, Perry and Lindell (2004) highlight how there are relationships that have not been statistically tested or replicated.

Thus, social marketing is the only approach to provide empirical evidence, albeit limited, of its effectiveness in influencing the public to undertake emergency preparedness behaviours.

2.5.3.2 The target audience – research and segmentation

The three literatures differ in their use of research to understand the target audience. The emergency management approaches can be characterised as top down. Researchers predominantly investigate how an element of risk communication (i.e. the message) that they have designed influences the public to prepare. However, social marketing is a bottom-up approach whereby the approach is designed based on the needs of the public.

Although there are differences in the use of research to understand the target audience, all three approaches recognise the need to use different approaches to target different groups of the public. The risk communication literature highlights how information should be tailored to the needs of

particular groups such as the elderly and immigrants. The literature on the PADM highlights how groups of the public can be segmented and targeted with risk communication based on the demographic characteristics that make particular groups of the public more likely to prepare. Social marketing highlights different types of segmentation strategy (e.g. demographic, geographic, stage of the behaviour change) that can be used to target different groups of the public.

2.5.3.3 Consideration of the benefits and requirements of preparing

The three areas of literature all consider the effectiveness/benefits of preparedness actions and that resources are required for the public to be able to undertake actions to prepare.

Both the PrE model and the PADM include variables covering the efficacy of resources required to prepare. Research by Paton et al. (2008b) also highlighted that when people believe the benefits of preparing outweigh the costs and that the outcome of preparing is achievable preparedness intentions were positively influenced. A social marketing approach should maximise the benefits of preparing and minimise the barriers and costs of undertaking preparedness actions.

2.5.3.4 The communication of the preparedness information

All three areas involve the communication of information to the public. This is the key focus of risk communication with the literature providing recommendations regarding the source, message, channel and receiver. Risk communication is integrated in the PADM as a factor that influences the adoption of protective actions. Social marketing also encompasses communication through its focus on promotion. As outlined above, the social marketing promotional strategy can incorporate the recommendations from the risk communication literature and the PADM.

The three areas of literature also highlight how preparedness approaches involve more than one-way communication to the public. For example, the emergency management literature highlights the role of interaction and discussing hazards in group activities at school, in the community or in the workplace. Social marketing approaches consider place in terms of the accessible locations where the behaviour of preparing can be performed. However, these locations are also where any products or services that would facilitate the desired behaviour of preparing (e.g. ready-made emergency kits, family preparedness guides) would be disseminated to the public. Thus, whilst risk communication and the PADM cover how communication channels and interaction can be used to influence the public to undertake preparedness actions, social marketing incorporates these areas and also products and services that can facilitate the behaviour.

The above sections examined the three approaches concerned with influencing public preparedness. They have shown that although there are many similarities between the three areas, social marketing is a more encompassing approach to influencing public preparedness that may integrate the emergency management literature. However, whilst it has been shown how social marketing has the potential to influence the public to undertake preparedness behaviours, there is limited literature on the application of social marketing to disaster preparedness (Ramaprasad, 2005). As a number of ethical considerations associated with the application of social marketing have also been raised, there is a need to further understand both the benefits and challenges of applying social marketing to influence the public to undertake preparedness behaviours. To address this need, this research will address the following questions;

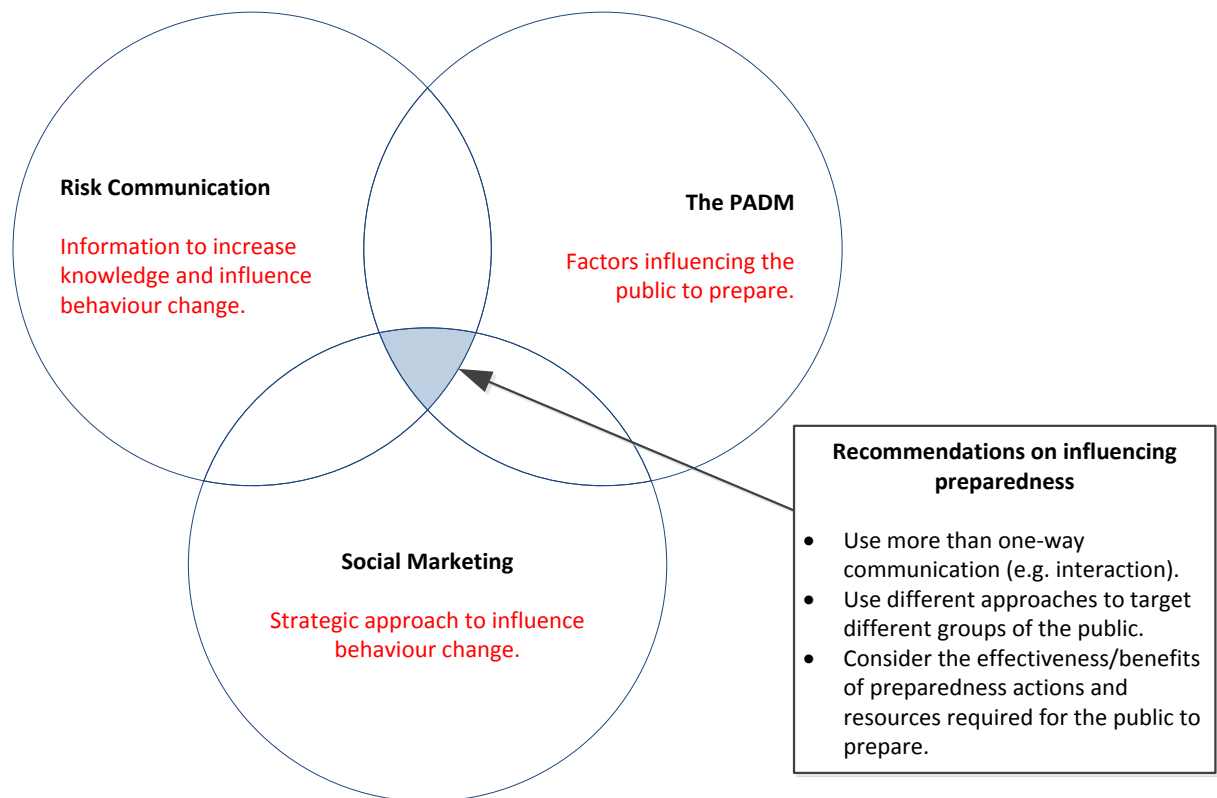
3. *What are the benefits, barriers and risk factors for EMAs who utilise social marketing to influence their public's evacuation preparedness behaviours?*
4. *What are the theoretical arguments that inform this area of enquiry?*

Addressing these research questions will make a theoretical and practical contribution to both the social marketing and emergency management literature. As outlined above there is a limited understanding concerning influencing behaviour change in this area. This research will also provide an understanding of the contextual and environmental factors that impact on how public preparedness is governed upstream. It will also contribute to knowledge through the examination of the ethical issues and risks associated with applying social marketing to influence the public to prepare for mass evacuation.

2.6 Conclusion

As Figure 2.3 highlights, the emergency management and social marketing literature provide many recommendations on the design of approaches to influence the public to undertake preparedness actions. However, due to the absence of research from an EMA perspective, there is a lack of knowledge on the extent to which the recommendations are being implemented.

Figure 2.3 Recommendations from the three areas of literature on influencing preparedness



Reviewing the emergency management and social marketing literature also highlighted the need for further research on the concept of responsibility related to public preparedness, particularly from the perspective of the EMAs responsible for ensuring that the public are prepared.

Finally, the chapter illustrated how social marketing is a potential approach that could draw on the emergency management literature to influence the public to prepare for mass evacuation. However, due to social marketing's limited application in emergency management contexts and the ethical concerns associated with its application, there is a need for further research to understand its application.

The next chapter examines the theoretical literature to understand the EMA perspective of preparedness and the concept of responsibility in relation to the governance of risk and individuals. Frameworks and concepts are outlined that are used to interpret the findings of this research in the discussion chapter of the thesis.

Chapter 3. Institutional Governance Practices

3.1 Introduction

The research questions outlined in the previous chapter highlighted the exploratory nature of this research. Due to the absence of research on EMA perspectives of public preparedness and the distribution of responsibility for public preparedness, there was a need to review alternative areas of literature in order to conceptualise a theoretical framework to understand the new insights that emerged from this research. This chapter draws on the frameworks of risk governance, risk society and governmentality to understand these new insights and the processes and practices institutions use to govern the public and manage risk. These frameworks and their associated concepts enable the researcher to interpret and theorise the findings of this research in subsequent chapters of this thesis.

The first section of this chapter draws on the risk governance literature (Walker et al., 2010, 2013; Kuhlicke et al., 2011) to understand recent changes in how hazards are governed by institutions and the implications of these changes. It will show how hazards are governed at multiple levels, involving multiple actors and how the responsibility for hazards has been distributed between different actors. The process of risk governance (IRGC, 2005, 2007; Renn et al., 2011; Klinke and Renn, 2012) will be examined to understand the potential issues faced in governing risks characterised by uncertainty, complexity and/or ambiguity.

The second section discusses Beck's (1992, 1999, 2002) risk society thesis to understand how particular types of risk are argued to be institutionally unmanageable and therefore no one is held responsible. It will examine the relationship between risk and knowledge and address how an unawareness of risk may exist. It will also outline Beck's (1992, 1999) concept of individualization and the shift towards the requirement for individuals to make a more active contribution to the different aspects of their life.

The chapter concludes by drawing on Foucault (1972, 1978, 1984, 1988, 1993, 1995, 2003, 2009) to understand the different techniques that institutions may use to govern their public to prepare and accept more responsibility for their preparedness. The section will draw upon the governmentality concepts (1978, 2003, 2009) of techniques for acting upon the actions of others (techniques of power) and techniques concerning the conduct of oneself (techniques of the self).

The concept of governance and its relevance to understanding institutional perspectives of public preparedness is introduced briefly in the next section before moving on to examine the literature covering disaster and risk governance.

3.2 Governance

Although there are multiple definitions and applications of the term governance, Pierre and Peters (2000) outline how governance is concerned with providing direction to steer society and how collective goals can be achieved. It *“refers to the means for achieving direction, control, and coordination of wholly or partially autonomous individuals or organizations on behalf of interests to which they jointly contribute”* (Lynn et al., 2000, p.235). Governance also includes the institutions, traditions, actions and processes through which decision making takes place (International Risk Governance Council (IRGC), 2007). With its focus on directing and coordinating individuals, it is important to examine the disaster and risk governance literature to understand the findings of this research on the practices and processes institutions use to govern (i.e. influence) their public to prepare for mass evacuation.

In modern societies, governance is a combination of governing by both public and private sector actors operating at different levels. ‘New governance’ in Western Europe also involves societal participation (Pierre and Peters, 2000, p.7). In the UK, the term governance also describes the changing nature and role of the state in the 1980s and 1990s related to neoliberalism and the rolling back of the state (Bevir, 2009). Traditional forms of governance involved national governments steering from the top down (Kjær, 2004). However the new form of governance that emerged during the 1980s and 1990s is concerned with government not being the only actor to address social issues (Kooiman, 2003).

The next section examines the implications of this new form of governance in hazard and disaster management contexts before moving onto examine the literature on risk governance.

3.2.1 Governance in disaster management contexts

Defining the term ‘*disaster governance*’, Tierney (2012) outlines how it encompasses *“interrelated sets of norms, organizational and institutional actors, and practices (spanning predisaster, transdisaster, and postdisaster periods) that are designed to reduce the impacts and losses associated with disasters arising from natural and technological agents and...terrorism”* (p.344). Norms include laws, regulations, standards and frameworks that encourage collective action (Tierney, 2012). As this research focuses on predisaster preparedness, this section examines the governance literature related to the management of hazards and threats before a disaster occurs.

Although there is limited literature and research on governance in emergency and disaster management contexts (Scolobig et al., 2014; Tierney, 2012), the changing governance context outlined

above is relevant to the institutional management of hazards. Walker et al. (2010, 2013) and Kuhlicke et al. (2011) highlight three characteristics of these changes that have implications for the governance of natural hazards in Europe. These characteristics provide an understanding of the different actors that are involved in managing hazards and how the distribution of responsibility is changing. As such this relates to the second research question that this research seeks to address.

The first characteristic is concerned with multi-level governance processes resulting from the '*hollowing out of the state*' which "*refers to the loss of functions upwards to the European Union, downwards to special-purpose bodies and outwards to agencies*" (Rhodes, 1997, p.17). The traditional linear chain of command has been replaced with a more complex network of organisations and actors (Rhodes, 1997; Walker et al., 2010, 2013). Kuhlicke et al., (2011) highlights an increased EU governance of natural hazards such as flooding. Examining multiple levels of disaster governance (global/international, regional, national and organisational), Tierney (2012) highlights how the UN International Decade for Natural Disaster Reduction in the 1990s heavily influenced disaster governance strategies and included a focus on disaster preparedness. For example, the UN International Strategy for Disaster Reduction (ISDR) launched the Hyogo Framework for Action 2005-2015 which includes five priorities, one being to "*strengthen disaster preparedness for effective response at all levels*" (ISDR, 2007). Although the literature focuses predominantly on the governance of natural hazards, there is also increased EU governance of man-made hazards such as chemical accidents through the introduction of Seveso legislation.

The second characteristic of the changing governance context is the shift from a single centralised authority to a multiplicity of actors for each policy area (Rhodes, 1997; Kuhlicke et al., 2011; Walker et al., 2010, 2013). Although actors outside of the public sector have always participated in the management of natural hazards, Walker et al., (2013) highlight how for "*different hazard and national contexts we can accordingly observe greater provision for the participation of a wider range of private, non-governmental organisations and community stakeholders and the development of new roles in hazard and risk management*" (p.2212). For example, following the 1995 Kobe earthquake in Japan disaster related NGOs significantly increased and national legislation was amended to recognize and regulate NGOs (Tierney, 2012).

The final characteristic relates to the second research question outlined in Chapter 2 on how there have been changes in the distribution of responsibility and a shift of responsibility away from the state (Walker et al., 2010, 2013; Kuhlicke et al., 2011). This new form of governance is termed '*distributed*

responsibility’ by Walker et al. (2010) and refers to the responsibilities associated with natural hazards being shared with the private sector, NGOs and individuals. *“Those at risk – residents, businesses, farms, infrastructure managers, etc. – are gradually transformed into risk managers and active participants of the multi-scale risk governance network as they are encouraged or even required to take more responsibility for their actions”* (Kuhlicke et al., 2011, p. 806). For example, UK Government policy highlights how the public and the private sector need to accept more responsibility and some of the financial cost associated with flood risk (Watson et al., 2009). The concept of the responsibility for risk management and emergency planning being distributed is supported by Collier and Lakoff (2008) who discuss *‘distributed preparedness’* in the context of United States domestic security.

“By ‘distributed’, we mean that responsibility was delegated to different levels of government and to both public and private agencies, according to their competencies and capacities and according to their spatial relationship to a critical target. By ‘preparedness’ we indicate a form of planning for unpredictable but potentially catastrophic events. The aim of such planning is not to prevent these events from happening but rather to manage their consequences (Collier and Lakoff, 2006; Lakoff, 2007)” (Collier and Lakoff, 2008, p.11).

Highlighting the potential negative implications of distributed responsibility, Walker et al. (2010) outline how sharing responsibility for natural hazards could potentially result in responsibilities becoming unclear and policy making and policy implementation tasks becoming fragmented.

Although the changing governance context has implications for how hazards are governed, there are differences in how different hazards are governed in different contexts (Tierney, 2012; Scolobig et al., 2014; Walker et al., 2013). Tierney (2012) outlines how *“disaster governance regimes tend to be fragmented and unbalanced”* with the focus predominantly being placed on disaster response rather than on mitigation, preparedness or recovery (p.348). Disaster governance activities are also suggested to vary in terms of their comprehensiveness, the hazards addressed and the activities included across different hazards and disasters (Tierney, 2012). This is supported by research findings highlighting differences in how natural hazards and risks are governed both within and across European countries (Scolobig et al., 2014; Walker et al., 2013).

A framework for profiling risk governance was developed by Walker et al. (2013). The framework incorporates eight governance characteristics including the distribution of governance between national, regional and local levels, the extent to which those at risk are responsible for protecting themselves compared to the responsibility lying with government, the extent and culture of stakeholder participation, the provision of insurance, the extent to which risk communication to the public occurs and the balance between governance tasks and the availability of resources. The

framework was applied to four European countries (Austria, Iceland, Italy and the UK) to compare the governance profiles for different natural hazards in the same context, different natural hazards in different contexts and the same natural hazards in different contexts. Findings showed that governance profiles varied based on both the hazard and context. Further research comparing the governance profiles for multiple risks in two countries (Italy and France) was also undertaken by Scolobig et al. (2014) using three sets of characteristics; stakeholders and governance level, decision support tools and mitigation measures, and stakeholder cooperation and communication. Similar to the framework developed by Walker et al. (2013), these characteristics also encompassed the responsibility of those at risk for protection, and risk communication. The study by Scolobig et al. (2014) involved qualitative research with multiple emergency management stakeholders and also found differences in governance systems between the two countries and also based on the type of risk within a country. These findings are important as this research involves both multiple countries and different types of risk.

As outlined above, the literature covering governance in emergency management contexts is in its infancy (Tierney, 2012), therefore the next section will examine the literature on risk governance. As outlined by Tierney (2012) *“disaster governance can be subsumed under the more general rubric of risk governance, which consists of the application of governance principles to the risk and risk-reduction domain”* (p.343). Whilst there are additional forms of governance (e.g. environmental, earth system, corporate), this chapter focuses on risk governance due to the findings of this research highlighting the key role that risk plays in determining EMAs approaches to influencing public preparedness.

3.2.2 Risk governance

The concept of risk governance is also recent, emerging in Europe at the beginning of the new millennium (van Asselt and Renn, 2011). It covers a wide range of risks including safety and security, health and medical, and environmental risks such as hazards and disasters (Tierney, 2012). From an academic perspective, risk governance is concerned with *“how to deal with demanding public risks”* (van Asselt and Renn, 2011, p.434). Renn et al. (2011) further elaborate how;

“Risk governance pertains to the various ways in which many actors, individuals and institutions, public and private, deal with risks surrounded by uncertainty, complexity and/or ambiguity. It includes formal institutions and regimes and informal arrangements. It refers to the totality of actors, rules, conventions, processes, and mechanisms concerned with how relevant risk information is collected, analysed, and communicated, and how regulatory decisions are taken (IRGC 2005, 2007; van Asselt 2007)” (p.233).

With its focus on how institutions deal with risks, the risk governance literature provides a framework to understand the institutional perspective that is absent from the emergency management and social marketing literature outlined in Chapter 2. The risk governance literature provides an understanding of the processes institutions use to select and manage the risks that they prepare the public for. It also highlights the need to consider contextual factors including “*institutional arrangements*” (e.g. laws and regulations determining the roles, responsibilities and relationships of the actors) and “*political culture*” (e.g. different risk perceptions) (Renn, 2008, p.9).

As evidenced in Chapter 2, academic approaches to public preparedness focus on the communication of risk information. However, as the findings of this research will demonstrate, influencing the public to prepare requires more than risk communication. EMAs are also responsible for monitoring and assessing the risks that they influence the public to prepare for. As “*not all risks are equal*” (Renn et al., 2011, p.234), this has implications for the risks that governments and institutions influence their public to prepare for. In addition to risk communication, risk governance also encompasses the identification, assessment and management of risks (IRGC, 2007). This section will examine the literature on risk governance to understand how risks may (not) be governed and the implications that each stage of risk governance may have on the approaches EMAs use to influence their public to prepare.

3.2.2.1 Risk governance framework

The traditional model of risk analysis, consisting of risk assessment, risk management and risk communication, has been criticised for being too narrow to include the different actors and processes involved in governing risk (Renn et al., 2011). In response to these criticisms, the IRGC (2005, 2007) developed a risk governance framework that extends the traditional risk analysis model. The framework includes four phases of the risk governance process; pre-assessment, appraisal, characterisation and evaluation, and risk management. A fifth component of the framework is risk communication which occurs throughout each phase of the risk governance process. Whilst the “*IRGC...confines its efforts to (predominantly negatively evaluated) risks that lead to physical consequences in terms of human life, health, and the natural and built environment*” they outline how the framework may be extended to investigate other types of risk including financial, social or political risks (IRGC, 2005, p.19)

The framework was subsequently revised by Klinke and Renn (2012) and Renn et al. (2011) to include the following activities; pre-estimation, interdisciplinary risk estimation, risk characterisation, risk evaluation, and risk management. This section examines the different elements of the frameworks and

the implications that each element may have on how EMAs influence their public to prepare and the particular risks that the public are prepared for.

Pre-estimation

Termed pre-assessment in the IRGC's (2005, 2007) framework, pre-estimation is concerned with "*screening*" different types of actor (e.g. governments, NGOs, the public) to explore what they identify as risks (Renn et al., 2011, p.239). This process is known as framing and involves "*the selection and interpretation of phenomena as relevant risk topics*" (Renn, 2008, p.48). Klinké and Renn (2012) outline how human actors create and select risks, with some risks being viewed as worthy of consideration and other risks being ignored. Different groups of actors may also vary in what they consider as a risk (Renn et al., 2011). Thus, the public may only be influenced to prepare for particular risks selected by EMAs.

"*Black Swans*" are a potential governance deficit that may occur during pre-assessment (IRGC, 2007, p.9). They are situations where there is no awareness of a hazard or a possible risk. Aven (2013) argues that "*a black swan is to be seen as a surprising extreme event relative to the present knowledge/beliefs*" and examines whether the 2011 Fukushima Daiichi nuclear disaster in Japan can be categorised as a black swan (Aven, 2013, p.49). Whilst knowledge existed of the risks and extreme consequences associated with tsunamis, the impact of the tsunami on the nuclear power plant was rare (Aven, 2013). The 1976 earthquake that struck Tangshan (China) can be considered a "*black swan*" as the earthquake was unforeseen with no warning signs. As a result, the Tangshan population were unprepared and the earthquake measuring 7.8 on the Richter scale resulted in 250,000 deaths (Kirkland, 2010). Walker et al. (2010) and Coaffee et al. (2008) also highlight situations which could be described as "*black swans*". In 2007, areas of Hull (UK) that were not considered at risk of flooding experienced flooding resulting in many people being surprised (Walker et al., 2010). Coaffee et al. (2008) also discuss "*unexpected incidents*" in the form of flash flooding in Newcastle upon Tyne in 2005 (p.203). In the long term, Coaffee et al. (2008) outline how UK local authorities that do not consider their area at risk of terrorist attack may be caught under-prepared if an attack occurred.

Interdisciplinary risk estimation

This second stage of the risk governance process is termed appraisal in the IRGC framework and is concerned with gaining and reviewing knowledge to decide whether a risk should (not) be taken (IRGC, 2005). It involves assessing both the risks to human health and the environment and also assessing related concerns and their social and economic implications (Renn et al., 2011). This consists of undertaking two activities; a scientific risk assessment and a concern assessment.

A risk assessment produces *“the best estimate of the physical harm that a risk source may induce”* (Klinke and Renn, 2012, p.281). Characteristics that may be used to estimate risk include; the extent of damage, probability of occurrence, uncertainty, the geographical dispersion, duration and reversibility of damage, delays between the event and damage occurring and social impact. The IRGC (2005) identify three challenges of undertaking risk assessments that are related to the quality of risk and hazard knowledge available and that with the addition of simple risks form four categories of risk; ‘complexity’, ‘uncertainty’ and ‘ambiguity’ (p.14). As will be outlined later in this chapter, differentiating risks based on the four categories has implications for the design of the risk management strategy (IRGC, 2007).

Simple risks are those with obvious causes and negative consequences, low uncertainty and low levels of ambiguity (van Asselt and Renn, 2011; IRGC, 2005). An example of a simple risk is a natural event that regularly reoccurs such as seasonal flooding.

Complexity relates to the *“difficulty of identifying and quantifying causal links between a multitude of potential causal agents and specific observed effects”* (Renn, 2008, p.75). Sophisticated chemical facilities are considered to be a complex risk.

Uncertainty refers to limited or absent scientific knowledge that results in difficulties in assessing and estimating risk (Klinke and Renn, 2012). Risks categorised as highly uncertain include terrorism and many natural disasters. Renn et al. (2011) outline how in the context of assessing risks, it is important to acknowledge that knowledge is incomplete and selective, resulting in uncertain assumptions and predictions. This is supported by Giddens (1999) who argues how science involves a process involving *“constant revision of claims to knowledge”* (p.1).

Interpretative and normative ambiguity refers to situations where there are different and sometimes conflicting views and interpretations of the same risk phenomena (Klinke and Renn, 2012).

Interpretative ambiguity is concerned with identical risk assessments being interpreted differently whereas normative ambiguity refers to different concepts for what is considered as tolerable (Renn, 2008).

Risks vary in their levels of complexity, uncertainty and ambiguity (Klinke and Renn, 2012). For example, nuclear energy is suggested to have high complexity and high ambiguity and low levels of uncertainty. The IRGC (2005) outline how *“risks that appear simple turn out to be more complex, uncertain or ambiguous as originally assessed. It is therefore essential to revisit these risks regularly*

and monitor the outcomes carefully” (p. 51). Risks may also shift between categories as outlined by de Vries et al. (2011) who highlight how as a result of climate change flood prevention has moved from a simple risk problem to uncertain and ambiguous.

Interdisciplinary risk assessment also involves undertaking a concern assessment whereby social science experts examine the issues that individuals, society and stakeholders associate with a risk (Klinke and Renn, 2012). This involves understanding risk perceptions and the social and economic implications of a risk (IRGC, 2005).

Risk characterisation and evaluation

The characterisation and evaluation of a risk are two closely linked and interrelated phases of risk governance and will therefore be discussed together (Klinke and Renn, 2012). This stage of risk governance is one of the most controversial and is concerned with the process of judging a risk and justifying the evaluation of its tolerability and societal acceptability (IRGC, 2005, Renn et al., 2011).

Klinke and Renn (2012) outline how many approaches adopt the *‘traffic light model’* whereby risks are placed on a diagram based on both their probability and impact (p.282). Based on their position on the diagram, a risk is either acceptable (requiring no further intervention as the risk is unlikely to occur and the impact would be minimal), tolerable (the benefits makes the risk worthwhile however risk reduction measures are required as there may be occasional serious impacts) or intolerable (catastrophic impacts are likely to occur and outweigh the benefits of the risk). To determine whether a risk is acceptable, tolerable or intolerable the information and data gathered during the interdisciplinary risk estimation phase is used.

To judge the tolerability and acceptability of a risk involves both risk characterization and risk evaluation (IRGC, 2005). Whilst risk characterization is concerned with determining the evidence-based component to make the judgement, risk evaluation is concerned with determining the value-based component. It is important to note that evaluations of risk may change over time (Renn et al., 2011).

Risk Management

“Risk management involves the design and implementation of the actions and remedies required to avoid, reduce, transfer or retain the risks” (IRGC, 2007, p.13). The risk management phase begins by reviewing all information collected from the previous phases as this information is used to assess, evaluate and select risk management options (Renn, 2008). Acceptable risks are suggested to require no further risk management (Renn et al., 2011). For intolerable risks, risk management should stop the

activity causing the risk or in situations where this is not possible, societal resilience should be increased. For risks categorised as tolerable *“public risk management needs to design and implement actions that render these risks either acceptable or sustain tolerability in the longer run by introducing risk reduction strategies, mitigation strategies, or strategies aimed at increasing resilience of society as a whole or particular communities”* (Renn et al., 2011). However, a potential issue in risk management is that *“no entity is responsible for managing the risk, or several are and things “fall between the cracks””* (IRGC, 2007, p.14).

The first activity of risk management is to select one of the four risk management options; risk avoidance, risk reduction, risk transfer and self-retention (Renn, 2008; IRGC, 2005). Risk avoidance is outside the scope of this thesis as it involves excluding the risk (e.g. through abandoning a particular technology) and this thesis focuses on the risk of hazards and threats that EMAs are influencing their public to prepare for. There are many ways in which risks can be reduced (e.g. technical standards, insurance, education) however this thesis is concerned with the reduction of risk through public preparedness for mass evacuation. Risk transfer involves passing the risk onto a third party whereas self-retention means doing nothing but accepting full responsibility for this decision and the consequences of doing nothing. The selection of risk management options will have implications on how EMAs influence the public to prepare for mass evacuation. Once the risk options have been identified, they also need to be assessed, evaluated, selected, implemented and monitored (Renn, 2008).

The IRGC (2005), Renn (2008) and Klinke and Renn (2012) also suggest different risk management strategies for each of the four categories of risk outlined above. Simple risks, also termed *‘linear risk problems’*, are routinely handled by balancing the pros and cons of the risk as the risk is easy to assess and is well known (Klinke and Renn, 2012, p.285). For complex risks, risk-informed management and the risk and concern assessments outlined above are particularly important for resolving and managing the risk. The first stage of managing highly uncertain risks involves acquiring additional knowledge. However if additional knowledge does not reduce uncertainty, a *“precaution-based management”* approach should be adopted to build resilience and decrease vulnerability (Klinke and Renn, 2012, p.285). For risks with high ambiguity, risk managers are recommended to adopt a discourse-based approach with stakeholder participation in decision making. This approach is designed to reach stakeholder consensus on the acceptability and tolerability of a risk.

Risk Communication

Risk communication is not a separate phase of the risk governance process but is considered to be at the core of successfully assessing and managing risks (IRGC, 2005). As risk communication was covered in detail in the previous chapter, it will be covered briefly here. The IRGC (2005) highlights how risk communication between risk professionals has been neglected in the literature. Communication includes “*exchanges between policy makers, experts, stakeholders, and the general public, and among themselves*” (Renn et al., 2011, p.242). Renn et al. (2011) and van Asselt and Renn (2011) discuss the concept of inclusion and how risk governance is a process involving multiple actors who are involved in framing the risk. Decisions have to be made on whom and what is included. Whilst particular actors are included in the risk governance process, Rayner (2011) outlines how “*the other side of the question of “who is included?” in participatory exercises is their potential for exclusion*” (p.169).

This section has examined the risk governance process and the implications that this process may have on the risks that the public are influenced to prepare for. It has outlined how multiple actors are involved in the creation, selection, assessment and management of risks. It has also recognised that not all risks are the same and how they are characterised by different levels of complexity, uncertainty and ambiguity. Different options for managing risks were also outlined including reducing the level of risk, transferring the risk to others and doing nothing.

The next sections will examine the work of Beck (1992, 1995 1999, 2002) and Foucault (1972, 1978, 1984, 1988, 1993, 1995, 2003, 2009) as they provide “*two distinct theoretical perspectives on risk*” (Mythen and Walklate, 2006b, p.379). Whilst there are additional theories of risk, the work of Beck and Foucault provide frameworks that enable a conceptual understanding of the institutional perspective of risk management.

3.3 Beck and risk society

Whilst Beck does not explicitly refer to risk governance, van Asselt and Renn (2011) and Walker et al. (2010) have discussed Beck’s work in relation to risk governance as it is concerned with how risks are managed. Beck (1999) outlines how “*risk society demands an opening up of the decision-making process*” (p.5). Beck’s theory of risk society will be discussed in order to understand the findings of this research on the decision-making processes of the institutions responsible for influencing their public to prepare for mass evacuation. Tierney (2007) highlights the importance of linking disaster sociology with theories of risk such as those proposed by Beck.

Beck (1992) and Giddens (1991) view risk as *“a defining characteristic of late modernity”* (Rayner, 2011, p.165). Three distinct eras are discussed by Beck (1995); ‘pre-industrial high cultures’, ‘classical industrial society’ and ‘industrial risk society’ (p.78). In the pre-industrial high cultures, natural hazards were the dominant type of danger that impacted upon particular areas. However, Beck (1999) views natural hazards as different to risks as they are not a result of decision making. For Beck (1999), *“risks presume industrial, that is, techno-economic, decisions and considerations of utility”* (p.50). Pre-industrial hazards were viewed as fate and attributed to an ‘other’ such as nature, god or demons. Institutional intervention, such as construction restrictions in vulnerable areas, is also suggested by Beck to have reduced the effects of natural hazards (Mythen and Walklate, 2006b; Mythen, 2004). Thus, whilst Beck examines how institutions manage risk, his work focuses predominantly on man-made risks rather than natural hazards.

Beck (2002) views risk as a modern concept. For Beck, since the late 1960s there has been a shift from the classical industrial society with its focus on the production of wealth to the risk society (Beck, 1992; Arnoldi, 2009). There are parallels between the work of Beck (1992) and Giddens (1999) as both cover the risk society, also termed second modernity and reflexive modernity (Boyne, 2003). Like Beck, Giddens (1999) also distinguishes between the industrial society and risk society. For the first 200 years of industrial society, external risks dominated. These are unexpected risks that happen regularly and to enough of the population that they are predictable and insurable. For both Beck and Giddens, the risk society is characterized by new types of risk that are the result of technological development. The *“technological challenges”* Beck (1999) refers to includes nuclear power, different types of chemical and bio-technical production and ecological destruction (p.52). These new types of risks and hazards are unlike those faced before and are the consequences of modernization (Beck, 1992). Beck (1999) and Giddens (1999) refer to the uncertainties that are created from this type of risk as ‘manufactured uncertainties’. *“In the risk society the unknown and unintended consequences come to be a dominant force in history and society”* (Beck, 1992, p.22).

Beck (1999) further outlines how *“risk society, fully thought through, means world risk society”* (p.19). In the second modernity, society has to respond to the challenges of *“globalization, individualization, gender revolution, underemployment and global risks”* simultaneously (p.2). Three global risks are the subject of Beck’s (2002) work on world risk society; ecological conflicts, financial crises and terrorism. For Beck (2002) terrorism is different to the other risks as it is intentional rather than an unintended consequence. Whilst risks were previously calculable and therefore insurable, the new types of global threats are *“difficult-to-control dangers”* that are uninsurable (Beck, 1999, p.142). It is a world of

uncontrollable risks that cannot be controlled at a national level. As will be explored further below, due to the issue of identifying causality, the emergence of the new types of risk has resulted in issues of accountability and responsibility. Beck (1999) outlines how risks involve decisions that were previously based on calculability that connected the causes and effects. However, the world risk society has made this approach invalid.

Whilst Beck (1992) argues that risks have an equalizing effect on those affected and that the threat of hazards occurring *“eliminates all the protective zones and social differentiation within and between nation-states”*, he also acknowledges that there are people who are more affected by how risks are distributed (p.62). For Beck (2002), *“global risks are...unequally distributed. They unfold in different ways in every concrete formation, mediated by different historical backgrounds, cultural and political patterns”* (p.42).

The new types of risk will have implications on how EMAs (cannot) influence their public to prepare for mass evacuation. Three ‘pillars of risk’ are discussed by Mythen (2004) to understand the foundations underpinning Beck’s risk society thesis (p.17). Firstly, unlike natural hazards that are suggested to impact particular locations, the new types of risk *“cannot be delimited spatially, temporally, or socially; they encompass nation-states, military alliances and all social classes, and by their very nature, present wholly new kinds of challenge to the institutions designed for their control”* (Beck, 1995, p.1). An example of this type of risk is the Chernobyl disaster which affected other nations in addition to Belarus and the Ukraine (Mythen, 2004). The effects of the explosion were also not limited temporally as they did not all occur instantaneously as health effects have developed years after. The second pillar of risk is that the new types of risk are catastrophic and irreversible in nature. Beck (1992) outlines how *“there are hazards which, if they occur, would mean destruction on such a scale that action afterwards would be practically impossible. Therefore, even as conjectures, as threats to the future, as prognoses, they have and develop a practical relevance to preventative actions”* (p.34). In terms of the ‘worst imaginable accident’ (WIA), Beck (1999) argues that there is no institution that would be prepared. The third pillar is concerned with the unmanageable nature of the new type of risk and how this has negatively impacted on the institutions responsible for the public’s health and security (Mythen, 2004). The types of risk during the classical industrial society were more *“institutionally manageable”* than the risks of the risk society (Mythen, 2004, p.20). Whilst institutions were able to use insurance to manage the risks of the early and mid-twentieth century, *“in contemporary culture, the continued development of non-limitable catastrophic risks implies that social institutions are unable to manage risk”* (Mythen, 2004, p.22).

'Reflexive modernization' is the response to these types of risk (Beck, 1992, 1999). This is a process of *"self-confrontation with the consequences of risk society which cannot (adequately) be addressed and overcome in the system of industrial society"* (Beck, 1999, p.73). Individuals are argued to have increased responsibility for the consequences of their actions and choices in reflexive modernity (Mythen, 2004).

3.3.1 Risk, knowledge and unawareness

Beck (1999) outlines how the concept of risk within the risk society is related to *"a peculiar synthesis of knowledge and unawareness"* (p.140). Decisions are made with incomplete knowledge and in situations where better and increased knowledge results in increased uncertainty. For Beck (1992), the risks of modernization such as nuclear and chemical contamination cannot be directly sensed. As these risks cannot be felt or seen, science and its associated theories and measuring instruments are required in order to make the hazards visible or interpretable as hazards. Beck (1992) further outlines how;

"Risks such as those produced in the late modernity... initially only exist in terms of the (scientific or anti-scientific) *knowledge* about them. They can thus be changed, magnified, dramatized or minimized within knowledge, and to that extent they are particularly *open to social definition and construction*. Hence the mass media and the scientific and legal professions in charge of defining risks become key social and political positions" (Beck, 1992, p.22-23, italics in original).

Expert judgement is required to 'objectively' determine risks. This involves cooperation between multiple disciplines, citizen groups, administrators and politicians. However, Beck (1992) highlights the arising *"definitional struggles"* and *"antagonistic definitions"* that result from this process (p.29). For example, there may be contradictions between the different organisations and actors involved. New knowledge may also turn situations that were previously considered normal by experts into hazards overnight (Beck, 1999). Risk knowledge is argued to be related to both history and culture. For Beck (1999) this is *"why the same risk is perceived and handled politically so differently throughout Europe and other parts of the globe"* (p.143). A very important distinction is also made between those who make the risk related decisions and those who face the consequences of the decisions (Beck, 1999).

In addition to discussing the role of knowledge in the creation of risks, Beck (1999) also highlights the importance of 'unawareness' that is related to the concept of *"black swans"* outlined above.

Unawareness refers to the situations of not yet being aware or no longer being aware (Beck, 1999). Different aspects of unawareness are distinguished by Beck (1999), including: *"(a) selective reception and transmission of the knowledge of risk...; (b) uncertainty of knowledge (in a concrete and a*

theoretical sense); (c) *mistakes and errors*; (d) *inability* to know (which may in turn be known or repressed); and (e) *unwillingness* to know” (p.122, italics in original). Beck (1999) outlines how linear modernization is characterised by two constructions of unawareness. The first is concerned with blocking out and rejecting other forms of knowledge and the second is concerned with the denial of the inability to know.

Understanding knowledge and unawareness is important for this research as Beck (1992) argues that risks that are not recognized scientifically do not exist and as a result are not prevented or treated. Thus, for risks where there is a lack of knowledge or unawareness, this may have implications on whether and how EMAs influence their public to prepare for mass evacuation.

3.3.2 Risk and responsibility – organized irresponsibility and individualization

The issue of responsibility is also important to this research as the second research question covers how EMAs distribute the responsibility for public preparedness. Both Beck (1999) and Giddens (1999) outline how the concepts of risk and responsibility are closely related. For Strydom (2002), Beck was instrumental in “*sociologically linking risk and responsibility*” (p.129). Two of the concepts developed by Beck concerning responsibility are central to this thesis and the issue of the responsibility for public preparedness.

Organized Irresponsibility

Beck’s (1995) concept of ‘organized irresponsibility’ is concerned with “*the contradiction between hazards produced by and within the system, and those unattributable to the system, which is neither responsible for them nor capable of dealing with them*” (p.64). Thus for Beck there are humanly created risks that no one is held specifically accountable for (Giddens, 1999). Different reasons are provided by Beck (1992, 1999) for this lack of accountability. Typically, the scientific and legal attribution of hazards is related to causality (Beck, 1999). However, due to the high levels of complexity, there are problems in attributing the causes and consequences of hazards to an individual actor. Also, as there are multiple actors involved in managing the complex risks “*there is a general complicity, and the complicity is matched by a general lack of responsibility*” (Beck, 1992 p.33). Instead of being held accountable, institutions have developed criteria for determining what is safe and have developed tools for ‘normalizing’ hazards that enables them to be “*underestimated, compared out of existence or made anonymous causally or legally*” (Beck, 1999, p.58). These criteria and tools allow the consequences of hazards to occur, however, results in no one being held accountable.

The concept of organized irresponsibility highlights the incompatibility between the complex risks that are produced through modernization and the current systems of risk management (Mythen, 2004). Beck (1999) highlights the mismatch between the manufactured uncertainties of the risk society and the procedures of risk identification and assessment that date from an earlier epoch. Thus, for Beck (1999) *“at the threshold of the twenty-first century, the challenges of the age of atomic, genetic and chemical technology are being handled with concepts and recipes that are derived from early industrial society of the nineteenth and the early twentieth centuries”* (p.55). A lack of institutional accountability and management of complex risks would also have implications on the types of risk that institutions influence their public to prepare for. This issue will be explored in the discussion chapter of the thesis.

Individualization

Whilst the concept of organized irresponsibility refers to a lack of accountability for complex risks, Beck's concept of individualization is concerned with how the consequences of modernization have resulted in the requirement for individuals to *“make themselves the center of their own planning and conduct of life”* (Beck, 1992, p.88). Beck's work on individualization is consistent with that of Giddens (Mythen, 2004). In his later work, Beck (1999) outlines how individualization means 'institutionalized individualism' (p.9). The welfare state is argued to design rights and entitlements for individuals rather than families. As these focus on employment, education and mobility, people are required to establish themselves as individuals. Whilst previously, the hazards and opportunities of life were managed within the community, family or social group, they are now imposed on individuals alone. These individuals increasingly have to make decisions for themselves from a range of different options. Beck and Beck-Gernsheim (2001) outline how;

“One of the decisive features of individualization processes, then, is that they not only permit but they also demand an active contribution by individuals. As the range of options widens and the necessity of deciding between them grows, so too does the need for individually performed actions, for adjustment, coordination, integration. If they are not to fail, individuals must be able to plan for the long term and adapt to change; they must organize and improvise, set goals, recognize obstacles, accept defeats and attempt new starts” (p.4).

Individuals also face the consequences of the decisions that they do and do not take. Problems that were once considered to be of a political nature are being transformed into one of personal failure (Beck, 1992). It is important to note that the process of individualization is considered a trend that may vary across groups and regions (Beck and Beck-Gernsheim, 2001). The desired contribution of individuals preparing to mass evacuate is explored throughout this thesis.

Before moving onto examine how the work of Foucault (1972, 1978, 1984, 1988, 1993, 1995, 2003, 2009) contributes to this thesis, this section will outline some of the criticisms that have been made of Beck's theory of the risk society. Whilst Beck makes many assertions that are considered '*grand theories*', they have not been tested empirically (Tulloch and Lupton, 2003, p.6). Alexander (1996) outlines how "*broad tendential speculations are advanced about infrastructural and organizational processes that have little grounding in the actual processes of institutional and everyday life*" (p.134). Beck's work on risk society is drawn upon to understand and conceptualise the findings of this research on the actual processes that EMAs use to influence their public to prepare to mass evacuate. Beck has also been criticised for focusing too heavily on institutions to the neglect of the role that culture has (Tulloch and Lupton, 2003, Elliot, 2002). However, this thesis is focused on the institutional perspective of preparedness. Critiques of Beck's work have also questioned whether Beck overemphasises the importance of risk and whether there is increased risk in society (Elliot, 2002). As outlined above, this chapter has drawn on Beck's work on risk as the findings of this research highlighted the importance of risk in determining EMAs preparedness approaches.

Dean (2010) and Mythen and Walklate (2006b) both examine Beck's risk society and Foucault's governmentality to understand particular risk issues. For Dean (2010), "*the sociological account of risk society and the analytics of governmental practices have something to learn from one another*" (p.205). The next section examines Foucault's concept of governmentality which is concerned with "*the technical and practical dimension of governing risk*" (Dean, 2010, p.213).

3.4 Foucault and governmentality

This section draws on Foucault's (1978) concept of governmentality as the concept offers a framework to understand how an individual's actions and behaviours are influenced by others (i.e. government organisations) and by themselves to achieve particular ends. The section draws upon a number of techniques highlighted by Foucault for governing the public including techniques for acting upon the actions of others (technologies of power) and techniques concerning the conduct of oneself (technologies of the self). These techniques provide a tool to theorise the findings of this research, not only on how EMAs influence the public to prepare for mass evacuation but also on how EMAs distribute the responsibility for public preparedness to different actors including individuals, encouraging them to internalise the responsibility for their preparedness. This section will also highlight how governmentality is related to the concept of risk outlined above and to the practice of social marketing outlined in Chapter 2.

The next section provides detailed background information on governmentality to understand the various techniques institutions are purported to use to govern populations.

3.4.1 Governmentality: a theoretical framework to understand mass evacuation preparedness

Government for Foucault is “*‘the conduct of conduct’: programmes, strategies, techniques for acting upon the actions of others towards certain ends*” (Rose, 1999, p.xxi). Foucault first introduced governmentality or the ‘rationality of government’ in his 1978 lecture series on ‘Security, territory and population’ at the Collège de France (Gordon, 1991). ‘Rationalities’ are defined by Pasquino (1980) as “*that which makes possible for us an intelligibility of practices, an intelligibility which at once traverses and is incorporated in these practices*” (p.29). In terms of the ‘rationality of government’, Foucault was interested in “*a way or system of thinking about the nature of the practice of government*” (Gordon, 1991, p.3). Governmentality, thus provides a theoretical framework for understanding the practices used to govern (i.e. influence) the public to achieve particular ends such as being prepared for mass evacuation.

Background to governmentality

For Foucault, the problem of government arose with intensity in the sixteenth century due to the shift towards state centralisation on one hand and religious dispersion and dissidence on the other. In his lectures, Foucault outlines how “*it is at the meeting point of these two movements that the problem arises...of “how to be governed, by whom, to what extent, to what ends, and by methods”*” (Foucault et al., 2009, p.89). These issues are central to this thesis in the context of public preparedness for mass evacuation and are explored in subsequent chapters.

Foucault (2009) views the art of government in the seventeenth century as being in a “*blocked situation*” between the large framework of sovereignty and the narrow model of the family (p.103). The release of the art of government is related to the emergence of the problem of the population, which occurred in the eighteenth century through demographic expansion (Smart, 2002) and statistics highlighting the regularities of the population (Foucault, 2009). Rather than focusing on the narrow model of the family, the art of government could focus on the population. Justi (1756) highlights how “*the progress or loss of population present a host of truths from which Physics, Medicine, and all the sciences which have for their object the health, conservation, protection or assistance of humanity may profit*” (p.10-11).

The objective of government is *“to improve the condition of the population, to increase its wealth, its longevity, and its health”* (Foucault, 2009, p.105). These objectives are achieved through techniques and strategies that are designed to conduct the actions and behaviour of the public. Donzelot (1979) defines technologies (e.g. confession, social insurance) as *“always local and multiple, intertwining, coherent or contradictory forms of activating and managing a population”* whereas strategies (e.g. Political economy, Marxism) are *“formulae of government”* (p.77). The different techniques for governing the public are outlined next.

3.4.2 Governmental techniques

This section outlines a variety of techniques that enable an understanding to be gained of how the public are governed by both themselves and by others (e.g. government) to achieve government objectives. These techniques provide a conceptual tool for this thesis to understand and conceptualise how EMAs influence the public to prepare for mass evacuation and how they distribute the responsibility for public preparedness. The section will explore how through the use of these techniques, the public are governed to behave in particular ways and how the public also govern themselves to behave according to a moral code. These techniques are also explored to understand how the public are governed to regulate their behaviour against accepted norms and standards. The concept of governmentality incorporates two different types of techniques; techniques for acting upon the action of others (technologies of power) and techniques concerning the conduct of oneself (technologies of the self). Foucault (1993) outlines how *“the contact point, where the individuals are driven by others is tied to the way they conduct themselves, is what we can call, I think, government”* (p.203). The dual role of both technologies of power and technologies of the self in governing the public is also highlighted by Lee (2007) who indicates how *“government is the act and art of conducting (directing, guiding, calculating, reasoning) and the conduct of oneself (one’s behaviours, self-guidance, one’s moral self-governance)”* (p.11).

Foucault (1988) views the government of the population as being linked to *“relationships of power”* (p.11). In a 1984 interview, he outlines how for him *“relationships of power”* mean *“the relationships in which one wishes to direct the behavior of another”* (p.11). The next section briefly discusses Foucault’s work on power before moving onto explore the techniques for governing the public’s behaviour.

Bio-Power

In his 1978 lecture, Foucault outlines how power is integral to governmentality, outlining how governmentality means;

“the ensemble formed by the institutions, procedures, analyses and reflections, the calculations and tactics that allow the exercise of this very specific albeit complex form of power, which has as its target population, as its principal form of knowledge political economy, and as its essential technical means apparatuses of security” (Foucault, 1978, p.102).

A central tenet of Foucault’s work on power is his ideas on bio-power (1984, 1978). Bio-power refers to *“the governance and regulation of individuals and populations through practices associated with the body”* (Wright, 2009, p.1). In contrast to sovereign power and its focus on deciding life or death, for bio-power it is the power to protect life where power is enacted, as the state seeks to solidify its position through the control of its population’s life (Wright, 2009). In his 1976 lecture, Foucault identifies two poles of bio-power; one pole focusing on the human body (anatomy politics) and one focusing on the species body or population (biopolitics) (Rabinow and Rose, 2006). Gastaldo (1997) outlines how *“bio-power is a subtle, constant and ubiquitous power over life. It is exercised through a set of power techniques”* (p.115). These techniques of power and how they can be used to govern individual bodies and the population are outlined in the next section and are explored in subsequent chapters of this thesis.

Techniques of power

The techniques of power focusing on the human body (anatomy politics) are disciplinary and emerged in the seventeenth and eighteenth centuries (Foucault, 2003). Disciplinary techniques of power *“included all devices that were used to ensure the spatial distribution of individual bodies (their separation, their alignment, their serialization, and their surveillance) and the organization, around those individuals, of a whole field of visibility”* (Foucault, 2003, p.242). In the second half of the eighteenth century, Foucault (2003) suggests that a new non-disciplinary technology of power emerges that modifies and integrates with existing disciplinary technologies of power but that does not replace them. This new technology of power focuses on the population (biopolitics) and is concerned with the knowledge and control of processes such as *“the birth rate, the mortality rate, longevity, and...a whole series of related economic and political problems”* (Foucault, 2003, p.243). Disciplinary techniques of power for governing bodies are outlined first before moving on to discuss non-disciplinary techniques for governing the population.

Disciplinary techniques of power

For Foucault (1995), *“discipline ‘makes’ individuals; it is the specific technique of a power that regards individuals both as objects and instruments of its exercise”* (p.170). Central to this is the relationship between the body, power and knowledge and a shift in focus occurring from the body as the object of power to new forms of power and the punishment of the *“knowable”* man (Smart, 2002, p.81). Smart

(2002) outlines how *“genealogical analysis reveals the body as an object of knowledge and as a target for the exercise of power. The body is shown to be located in a political field, invested with power relations which render it docile and productive, and thus politically and economically useful”* (p.75). Approved systems of knowledge and the accepted ‘truth’ form the basis of power over the population. It is knowledge that enables disciplinary technologies of power to work, as the public are knowable, they can be acted upon and governed. Through the exercise of power, Smart (2002) outlines how *“the human body, its elements and behavior, became subject to a political anatomy of detail, to discipline. Discipline is a technique of power which provides procedures for training or coercing bodies (individual or collective)”* (p.85). In Discipline and Punish, Foucault (1995) outlines how disciplinary power is derived from three instruments; hierarchical observation, normalizing judgement and the examination. These three instruments are now outlined.

Hierarchical observation

Hierarchical observation is concerned with the visibility and surveillance of the public and is also related to Jeremy Bentham’s Panopticon discussed below. Foucault (1995) outlines how *“the exercise of discipline presupposes a mechanism that coerces by means of observation; an apparatus in which the techniques that make it possible to see induce effects of power, and in which, conversely, the means of coercion make those on whom they are applied clearly visible”* (p.170-171). Thus, the apparatus designed for observation creates power as the public are or assume they are in a *“permanent and continuous field”* of surveillance (Foucault, 1995, p.177). By making the public visible, it is possible to know and alter them (Smart, 2002). Surveillance is also hierarchical in that it occurs at multiple levels as those who observe others are themselves being observed. The surveillance and observation of the public in disaster management contexts has been discussed by authors including Coaffee et al. (2008) and Mythen and Walklate (2006a,b, 2008) and is outlined further below.

Normalizing judgement

Normalizing judgement is concerned with the accepted norms or standards. Non-conformity is punishable and is what *“the exercise of disciplinary power seeks to correct”* (Smart, 2002, p.86). The art of punishing in the exercise of disciplinary power brings five operations into play. These operations are summarised succinctly by Foucault (1995) who outlines how *“the perpetual penalty that traverses all points and supervises every instant in the disciplinary institutions compares, differentiates, hierarchizes, homogenizes, excludes. In short, it normalizes”* (p.183). In addition to the use of punishment, discipline also involves the use of gratification and rewards. Thus for good behaviour there are rewards and privileges and for bad behaviour there is punishment and penances (Smart, 2002). The previous

chapter outlined how social marketing may be used to create social norms. The creation of an accepted norm in the form of the “*responsible citizen*” who takes responsibility for a variety of social risks including their resilience will be discussed later in this chapter.

The examination

Hierarchical observation combines with the normalizing judgement to create the examination, the third instrument through which disciplinary power works. Foucault (1995) outlines how hierarchical observation and the normalizing judgement combine into a “*normalizing gaze*” whereby surveillance enables classification and punishment (p.184). The examination “*manifests the subjection of those who are perceived as objects and the objectification of those who are subjected...in this slender technique are to be found a whole domain of knowledge, a whole type of power*” (Foucault, 1995, p.184-185).

The Panopticon

It is within Bentham’s Panopticon that these three instruments of disciplinary power outlined above are suggested to work best (Hopper and Macintosh, 1998). The Panopticon is an architectural structure that is designed to arrange “*people in such a way that, for example, in a prison, it is possible to see all of the inmates without the observer being seen, and without any of the prisoners having access to one another*” (Mills, 2003, p.45). In his work, Foucault (1995) viewed the Panopticon as a mechanism concerned with the operation of disciplinary power through observation and visibility.

“Hence the major effect of the Panopticon: to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power. So to arrange things that the surveillance is permanent in its effects, even if it is discontinuous in its action; that the perfection of power should tend to render its actual exercise unnecessary; that this architectural apparatus should be a machine for creating and sustaining a power relation independent of the person who exercises it; in short, that the inmates should be caught up in a power situation of which they are themselves the bearers” (p.201).

The Panopticon aims to control behaviour by including prisoners in their own surveillance, which results in the internalization of surveillance by the prisoner (Magill, 1997). As the prisoner does not know whether he is being watched, they must always behave as if they are being watched and therefore turn the gaze upon themselves. Foucault (1995) outlines how those who know they are in a “*field of visibility*” assume “*responsibility for the constraints of power, he makes them play spontaneously upon himself; he inscribes in himself the power relation in which he simultaneously plays both roles; he becomes the principle of his own subjection*” (p.202-203). Thus, it is the possibility of being observed that enables the operation of power and results in individuals modifying their behaviour.

The role of the Panopticon is the altering of behaviour and the training and correction of individuals (McHoul and Grace, 1993). Foucault (1995) himself outlines how the aim of the Panopticon is “*to strengthen the social forces-to increase production, to develop the economy, spread education, raise the level of public morality; to increase and multiply*” (p.208). Any institution is able to use the instruments of disciplinary power, such as the Panopticon (McHoul and Grace, 1993). The concept of the Panopticon will be drawn upon in subsequent chapters of this thesis, particularly to understand how some EMAs attempt to influence the public to prepare for mass evacuation by using social marketing techniques.

The application of the disciplinary techniques of power outlined above to emergency management contexts will be discussed below. The next section outlines non-disciplinary techniques of power – biopolitics, which focus on the government of the population rather than on the human body. It will show how both risk and social marketing are forms of biopolitics.

Biopolitics – non-disciplinary techniques of power

In his 1976 lectures, Foucault (2003) outlines how in the second half of the eighteenth century a new non-disciplinary technology of power emerges that he terms “*biopolitics*” (p.243). In contrast to disciplinary techniques of power that are applied to the human body, this new technology of power is concerned with “*man-as-species*” (Foucault, 2003, p.242). Smart (2002) outlines how the new technology of power is concerned with “*the exercise of power through the management or regulation of population*” (p.78). Rather than replacing the existing disciplinary techniques of power, this new non-disciplinary technology of power “*does dovetail into it, integrate it, modify it to some extent, and above all, use it by sort of infiltrating it, embedding itself in existing disciplinary techniques*” (Foucault, 2003, p.242).

The emergence of biopolitics is related to the identification of the problem of the population outlined above. Foucault (2003) outlines how “*it is these processes – the birth rate, the mortality rate, longevity, and so on – together with a whole series of related economic and political problems...which, in the second half of the eighteenth century, became biopolitics’ first objects of knowledge and the target it seeks to control*” (p.243). It is at this time, that phenomena such as the birth rate began to be measured in statistical terms (Foucault, 2003). Lee (2007) argues that “*statistics allows the problems of population to be made manageable and knowable. It allows a relationship of reflection, analysis, assessment, and as a result, malleability and regulation to be established between the bodies that govern and bodies that are to be governed*” (p.12-13). Statistics indicating low levels of preparedness

for emergencies and mass evacuation were outlined in previous chapters. These statistics allow government to know the level of preparedness and to develop strategies to manage low levels of public preparedness for mass evacuation.

For Foucault (2003), biopolitics led to the establishment of more subtle mechanisms such as insurance and safety measures for dealing with the problems of the population. It is through mechanisms such as these that the new non-disciplinary exercise of power was made possible (Smart, 2002). Whilst Ewald (1991) discusses the rationality of risk and insurance, exploring insurance is outside the scope of this thesis. As outlined above, the objective of government is viewed as being to improve the condition, wealth, longevity and health of the population (Foucault, 2009). The instruments that government use to achieve this are outlined by Foucault (2009).

“And the instruments that government will use to obtain these ends, are in a way, immanent to the field of population; it will be by acting directly on the population itself through campaigns, or, indirectly, by, for example, techniques that, without people being aware of it, stimulate the birth rate or direct the flows of population to this or that region or activity” (p.105).

Rabinow and Rose (2006) outline how biopolitics encompasses *“all the specific strategies and contestations over problematizations of collective human vitality, morbidity and mortality; over the forms of knowledge, regimes of authority and practices of intervention that are desirable, legitimate and efficacious”* (p.197). For example, Gastaldo (1997) examines health education policy in Brazil and concludes that health education policy can be viewed as a *“strategy of governmentality through biopolitics”* (p.119). Thus, biopolitics provides a tool for understanding the various strategies and approaches used to govern different problems of the population such as the public’s preparedness for mass evacuation.

The practice of social marketing, outlined in the previous chapter, may also be considered a strategy of governmentality through biopolitics. Like governmentality, social marketing is concerned with influencing public behaviour to achieve certain ends. Moor (2011) argues how social marketing is a technique of government:

“Social marketing is explicitly concerned with the refashioning of publics and populations, and thus relates directly to an analytical tradition interested in modes of governance. From Foucauldian analysis to more recent debates about the governance or the performativity of markets and economics, the discipline of sociology in particular has long been concerned with the discourses and techniques deployed to govern behavior and shape publics. Social marketing...is an important contemporary example of such a technique” (p.299-300).

Disciplinary and non-disciplinary techniques of power for governing the human body and population have been outlined above. Foucault's concept of governmentality also incorporates techniques concerning the conduct of oneself through technologies of the self. The next section discusses how these techniques enable individuals to govern themselves.

Technologies of the self

The technologies of power outlined above are only one side of the systems through which individuals are governed (Burchell, 1993). In his later work, Foucault (1993) shifts from a study of power relations to studying the *"creation of ethical agency"* and the techniques through which individuals are able to govern themselves (p.198). Foucault (1993) argues that governing people does not involve forcing people to do what government wants but that *"it is always a versatile equilibrium, with complementarity and conflicts between techniques which assure coercion and processes through which the self is constructed or modified by himself"* (p.204). The techniques through which individuals are able to construct their self are termed *'techniques of the self'* by Foucault (1993) and are defined as

"techniques which permit individuals to effect by their own means, a certain number of operations on their own bodies, on their own souls, on their own thoughts, on their own conduct, and this in a manner so as to transform themselves, modify themselves, and to attain a certain state of perfection, of happiness, of purity, of supernatural power, and so on" (p.203).

Foucault's work on techniques of the self has received significantly less attention than his work on power outlined above (Peterson, 2003). It is in his 1980 lectures at Dartmouth College that Foucault (1993) outlines how the analysis of oneself and techniques such as self-examination and confession can be found in the very early Greek, Hellenistic and Latin cultures. However, Foucault (1993) views modern interpretations of the self as being rooted in Christian techniques. Smart (2002) outlines how Foucault views techniques of the self as *"closely integrated with particular 'obligations of truth' in Christian societies, notably both to treat certain texts, propositions and decisions of specific authorities as 'true' and to reflexively explore 'the self, the soul and the heart', to tell the truth of oneself to self and others"* (p.108).

It is through ethical systems such as those in early Christianity, that the self is produced through practices of self-subjection (Turner, 1997). These ethical systems identify the ethical issues and shape moral activity. It is then through subjection that moral obligations are recognised and subsequently objectified into ethical discourses. The creation of discourses results in the production of identities and roles for individuals. Turner (1997) summarizes how *"subjection requires the production of a moral order and an ethical ethos which becomes the organizing principle of practices of the self; a moral code*

evolves by which moral identities are shaped and guided" (p.xxi). The use of techniques of the self to shift responsibility for social issues to the public and to create the role of "*responsible citizen*" is outlined below.

A shift in responsibility

Chapter 2 highlighted research examining the public's perceptions of the responsibility for their preparedness (Lindell and Whitney, 2000; Terpstra and Gutteling, 2008). The increasing shift of responsibility from the government to the public for a wide range of social issues such as crime has been highlighted by authors such as Garland (1996); Nettleton (1997); Rose (1993) and Lemke (2001). This section will outline how techniques of the self may be employed to enable and encourage the public to become active citizens and take responsibility for different areas of their life. As outlined in the previous chapter, social marketing approaches may be used to responsabilize the public for social risks including their preparedness for mass evacuation.

Since the 1970's, techniques of the self have become pertinent to government strategy due to the shift from a welfare state to an advanced liberal (also termed neo-liberalism) political rationality. This shift in political rationality is viewed as resulting in individuals who are more active in their government. Nettleton (1997) outlines how "*government has increasingly come to rely on these 'technologies of the self' to shape and enhance the capacities of individuals. The subjects of government within this context are autonomous, independent and self-reliant*" (p.212). The impact on how individuals are governed as a result of the shift to an advanced liberal political rationality is also highlighted by Rose (1993). He outlines how "*whilst welfare sought to govern through society, advanced liberalism asks whether it is possible to govern without governing society, that is to say, to govern through the regulated and accountable choices of autonomous agents – citizens, parents, employees, managers, investors*" (p.298). Burchell (1993) terms this new way of governing as a new form of "*responsibilization*" (p.276). Government strategy has involved shifting responsibility for social risks to the individual and making them an issue of "*self-care*" (Lemke, 2001, p.201). This research is concerned with how EMAs distribute the responsibility for public preparedness to different actors including the public. Rose (1996) outlines how government strategy involves making individuals active in their own self-government. He argues how individuals "*must take responsibility, they must show themselves capable of calculated action and choice, they must shape their lives according to a moral code of individual responsibility and community obligation*" (p.347). This is related to Beck's concept of individualization. The use of a "*responsibilization strategy*" for governing crime is discussed by Garland (1996) who outlines how the strategy involves devolving responsibility for crime prevention to agencies, organisations and

individuals outside of the state. The techniques identified for persuading the public to take responsibility for crime prevention include publicity campaigns and citizen self-help groups (i.e. Neighbourhood Watch). The main message of this strategy is that the state alone cannot be responsible for crime prevention and that the public must recognise that they also have a responsibility.

This transformation in government technologies and rationalities is suggested to be the result of a rise in expertise (Rose and Miller, 2010). Rose (1996) outlines how experts have enabled individuals to take responsibility for different areas of their life.

“Empowerment, then, is a matter of experts teaching, coaxing, requiring their clients to conduct themselves within particular cultural communities of ethics and lifestyle, according to certain specified arts of active personal responsibility. Empowerment, with all its emphasis on strengthening the capacity of the individual to play the role of actor in his or her own life, has come to encompass a range of interventions to transmit, under tutelage, certain professionally ratified mental, ethical and practical techniques for active self-management” (p.348).

In addition to enabling individuals to take responsibility for different areas of their life, experts are suggested to be in a “double alliance” with both political authorities and individuals. Working with political authorities, experts problematize new issues whilst also forming alliances with individuals and “translating their daily worries and decisions...into a language claiming the power of truth, and offering to teach them the techniques by which they might manage better...” (Rose and Miller, 2010, p.286). Experts assist individuals in gaining an understanding of themselves (Nettleton, 1997). Rose (1999) further elaborates, outlining how expertise creates the image of normality and how individuals can use this image to normalize and evaluate themselves and their conduct. It is through expertise that “regulatory techniques can be installed in citizens that will align their personal choices with the ends of government” (Rose and Miller, 2010, p.268; Rose, 1990).

It is important to note that Foucault (1988) acknowledged that techniques of the self are not invented by individuals themselves but may result from other influences.

“The subject constitutes himself in an active fashion, by the practices of the self, these practices are nevertheless not something that the individual invents by himself. They are patterns that he finds in his culture and which are proposed, suggested and imposed on him by his culture, his society and his social group” (p.11).

Foucault’s concept of governmentality and how techniques of power and techniques of the self govern the public to achieve particular ends has been outlined above. The next section will discuss how the

application of these concepts can be extended to disaster management contexts as discussed in the existing literature.

3.4.3 Situating governmentality in disaster management contexts

This section will demonstrate how the different concepts and techniques falling under governmentality can be extended and applied to disaster management and related contexts. Governmentality and governmental techniques have been discussed in the context of urban resilience strategies (Coaffee et al., 2008), terrorism and risk (Walklate and Mythen, 2010; Debrix and Barder, 2009; Aradau and Munster, 2007) and security (Lentzos and Rose, 2009). The appropriateness of applying governmentality to disaster management contexts will be examined before moving on to discuss how the application of governmentality has been extended to disaster management and related contexts.

Coaffee et al. (2008) highlight three reasons for drawing on governmentality to discuss the implementation of urban resilience strategies. The first reason is that governmentality provides a continuum linking the conduct of government to the conduct of the citizen (Dean, 1999). As outlined above, this thesis is concerned with understanding how EMAs influence the public to prepare for mass evacuation and how they distribute the responsibility for public preparedness to different actors including the public. Secondly, governmentality as viewed by Rose (1993) highlights the rise in new forms of control as a result of expertise. The rise in expertise outlined above related to the emergence of techniques of the self will be discussed below in relation to the creation of risks and the responsible citizen. The final reason provided by Coaffee et al. (2008) for drawing upon governmentality is that Foucault viewed sovereign power, surveillance and government as being able to operate at the same time and not as a progression (Hunt, 2003). The application of these different techniques in disaster management contexts will now be discussed. First, the application of techniques of power will be discussed before moving on to discuss how techniques of the self have been applied.

Techniques of power in disaster management contexts

As outlined above, disciplinary power is viewed by Foucault (1995) as being derived from the instruments of hierarchical observation, normalizing judgement, and the examination, and it is through the Panopticon that these three instruments work best. The applicability of these concepts to disaster management contexts is illustrated below.

In terms of hierarchical observation, authors such as Coaffee et al. (2008), Mythen and Walklate (2006b, 2008) and Aradau and Munster (2007) have discussed the increased surveillance of the public

due to the specific threat of terrorism. Coaffee et al. (2008) suggest that terrorist activity and an increase in crime levels in the UK in the 1990s saw an intensification of the “*surveillance approach*”. This is supported by Mythen and Walklate (2006b) who highlight the existence of both external forms of observation (government agencies observing various public activities) and a more inward type of surveillance (encouraging the public to report potential terrorist activities). Aradau and Munster (2007) outline how “*precautionary risk management implies the surveillance of all the population...Hence more and more technologies of surveillance are indiscriminately targeted at the whole population: stop and search policies in the UK, biometric identifiers or the introduction of identity cards*” (p.27). Rayner (2011) highlights the key role that risk plays in “*this governmental strategy for monitoring and managing populations by justifying the surveillance of citizens in the name of public health, social welfare, and more recently national security*” (p.167).

The Panopticon is drawn upon to understand this surveillance of the public. Whilst, Aradau and Munster (2007) suggest that for terrorist risk Panoptic surveillance targets the whole population, Mythen and Walklate (2008) outline how the surveillance of particular groups of the public, such as the Muslim Community, is an example of Panoptic operations (Mythen and Walklate, 2008). It is argued that there are two types of risk management that co-exist: those operating in an inclusionary zone and those that work through exclusionary tactics (Mythen and Walklate, 2006b). Debrix and Barder (2009) draw on Bigo and his concept of the “Banopticon” outlining how “*under a “banoptic” regime, anybody can become the object of banning micro-gazes or micro-surveillance tactics mobilized by all sorts of apparatuses involved in the population’s security or well-being*” (p.408).

The former UK emergency management structure can also be viewed as an example of hierarchical observation in that emergency management operated on three levels; national (Cabinet Office), regional (Government Offices for the Regions and Regional Resilience Teams) and local level (Local Resilience Forums). Coaffee et al. (2008) outlines how this structure can be viewed as an example of a neoliberal form of governmentality.

“Broader governance priorities of Central Government have helped shape the introduction of resilience through ideas based on principles of subsidiarity, embodying a neoliberal form of governmentality, where efficient government is sought through decentralizing responsibility whilst retaining control through requirements of assessment and the issuing of guidance”
(p.190-191).

Foucault’s concept of normalizing judgement has been applied to emergency management contexts in terms of the creation of accepted norms. Mythen and Walklate (2006b) argue that activating citizens through the inward type of surveillance outlined above normalizes the practice of surveillance. By

getting the public to observe others, it becomes normal for them to be observed themselves. Discussing the production of fear as a result of terrorism, Debrix and Barder (2009) outline how a *“generalized condition of terror”* has been created as the norm. They outline how *“these deplorable conditions are now what must be expected, accepted, and anticipated by populations whose lives are said to be constantly threatened and, as such, must become the objects of sustained normalization or heightened regulation”* (p.401). Thus, the fear of terror acts to normalize the public and regulate the public’s behaviour.

The role of risk, discourse and experts

Dean (2010) outlines how risk is a set of ways to order reality and make it calculable. It enables events to be made governable using particular techniques and to achieve particular goals. Risk also enables the population to be governed by both techniques of power and techniques of the self. Strydom (2002) outlines how for governmentality scholars, risk;

“is constructed through knowledge, techniques, practices and programmes as a governable entity, and at the same time it allows government to subject the population to surveillance, regulation and control and to force individuals and communities to be free and to take responsibility for themselves” (p.45).

As will be demonstrated in subsequent chapters of this thesis, the relationship between risk, knowledge and responsibility is central to addressing the research questions outlined in Chapter 2.

Focusing on terrorism, Mythen and Walklate (2006, 2008) and Walklate and Mythen (2010) highlight the role of discourse and experts in the creation and management of risk. They outline how *“the dissemination of dominant discourses of terrorism can function as a tactic of disciplinary control through which right-thinking citizens are encouraged to come to order and adhere to governmental objectives”* (Mythen and Walklate, 2006b, p.390). It is through institutional discourse that risks are created and made thinkable (Mythen and Walklate, 2006b; Walklate and Mythen, 2010). The discourse of terrorism is suggested to determine what can and cannot be said and done about the risk of terrorism.

Although Foucault did not explicitly write about risk, his early work did focus on discourse. For Foucault, discourse is not concerned with language but with bodies of knowledge (McHoul and Grace, 1993). Discourse is used by Foucault (1972) to refer to *“the general domain of all statements, sometimes as an individualizable group of statements, and sometimes as regulated practice that accounts for a number of statements”* (p.80). Foucault argues how those with power and authority, the *“experts”*, control discourse and are able to dictate and speak the truth. He outlines how *“in every*

society the production of discourse is at once controlled, selected, organised and redistributed by a certain number of procedures whose role is to ward off its powers and dangers, to gain mastery over its chance events, to evade its ponderous, formidable reality” (Foucault, 1981, p.52). In the context of the discourse of terrorist risk, this is supported by Walklate and Mythen (2010) who outline how *“institutional discourses of risk disseminated by experts provide the boundaries of acceptable action, regulating social practices and reproducing ‘docile bodies’ that adhere to the status quo” (p.50).* This thesis is concerned with the approaches EMAs use to influence their public to prepare for mass evacuation of which discourse will be a part.

Technologies of the self in emergency management contexts

The concept of technologies of the self provides an understanding of how EMAs are distributing the responsibility for public preparedness. It was outlined above how techniques of the self have enabled the creation of an active citizen and a new form of governing termed *“responsibilization”* whereby the government shifts responsibility for different social risks to the public. Drawing on governmentality, Coaffee et al. (2008), Lentzos and Rose (2009), Debrix and Barder (2009), Lupton (2006), Mythen and Walklate (2006a, 2008), and Walklate and Mythen (2010) argue that resilience and security are additional social risks where government has transferred responsibility to the public. Coaffee et al. (2008) outline how security policy has seen the development of the *“responsible citizen”*, whereby responsibility for resilience is transferred from the state to individuals and institutions.

As outlined above, techniques of the self are concerned with moral obligations. Coaffee et al. (2008) outline how a 2008 police terrorist campaign encouraging people to report suspicious activity *“is aimed at everyone as part of their supposed moral duty as a responsible citizen” (p.234).* Thus, the government influences the public to take action as part of their moral duty. The public taking responsibility for risks as part of their moral duty is also discussed by Lupton (2006).

“As discourses on risk proliferate, more and more risk-avoiding practices are required of the ‘good citizen’. Risk avoidance has become a moral enterprise relating to issues of self-control, self-knowledge and self-improvement. It is deemed people’s own responsibility to take notice of risk warnings and act on them accordingly. Those people who fail to engage in such behaviours may thus often find themselves stigmatized and subject to moral judgements” (p.14).

The 2004 *“Preparing for Emergencies”* booklet that was distributed to every UK household is an example of the responsibilization strategy in practice. Mythen and Walklate (2008) outline how the advice in the booklet *“tends to individualize emergency situations and to ‘responsibilize’ people for their own risk management” (p.237).*

It was outlined above how discourses lead to the production of identities and roles for individuals. It is through both discourses and experts that the role of the responsible citizen is created (Mythen and Walklate, 2008). As outlined in the previous chapter, social marketing may also be used to create this responsible citizen.

Techniques for influencing the conduct and behaviour of individuals have been outlined and their application to emergency management contexts discussed above. However, these techniques may be met with resistance from the public as explored below.

3.4.4 Resistance

The techniques outlined above may not always be successful in achieving their objectives. Foucault did not assume that the exercise of power automatically leads to objectives being achieved and acknowledged the presence of resistance when there is power:

“There is no assumption in Foucault’s work that a formula of domination may achieve or realize a programmed end: to the contrary it is argued that struggle and forms of resistance necessarily accompany the exercise of power and further that analyses of programmes of social action or forms of social intervention invariable reveal a non-correspondence between intended effects and outcomes” (Smart, 2002, p.91).

Lupton (1997) also outlines how Foucault recognised that the exercise of power is not always successful *“and that intended outcomes often fail to materialize because disciplinary strategies break down or fail”* (p.102). Thus, government may use a variety of techniques to influence the public to prepare for mass evacuation but the public may still not undertake actions to prepare. The lack of public preparedness for mass evacuation was highlighted in Chapter 2. For Foucault, *“power is exercised only over free subjects (individual or collective), that is subjects whose conduct or action exists within a field of possibilities”* (Smart, 2002, p.133). Despite government efforts, the public still have the freedom to decide whether to prepare for mass evacuation or spend their time engaging in other activities. As highlighted in Chapter 2, one of the reasons the public do not prepare for emergencies is because they do not want to spend time preparing (Larsson and Enander, 1997).

Analysing health education in Brazil, Gastaldo (1997) also outlines how forms of resistance occur not only with members of the public but also with local level institutions such as health centres. Government objectives may be met with resistance from the institutions operating at different levels that have responsibility for promoting and achieving the objectives. Gastaldo (1997) outlines how *“the process of promoting knowledge and norms occurs within a web of micropowers of forms of control and*

resistance” (p.123). This thesis will draw upon Foucault’s notion of resistance to understand how the techniques government use to prepare their public for mass evacuation may fail in their objectives.

3.5 Conclusion

This chapter has drawn upon the frameworks of risk governance, Beck’s risk society and Foucault’s governmentality to understand the practices and processes institutions may use to manage risk and govern their public to achieve certain goals.

The frameworks have provided an understanding of the changing context in which EMAs are governing natural hazards. This includes shifts to multi-level governance, a multiplicity of actors and a distribution of responsibility for hazards among both institutions and the public. They have also illustrated the potential issues that may arise for EMAs during different stages of the risk governance process including an unawareness of risk.

Three key concepts have been addressed by all three frameworks that will be used in subsequent chapters to interpret and conceptualise the findings of this research; knowledge, risk and responsibility. The three frameworks have shown how;

- Knowledge is key in constructing and assessing risk.
- Not all risks are the same and the existence of different types of risk may have implications on how and whether institutions can influence the public to prepare.
- Individuals are increasingly being required to take responsibility for different risks.

The next chapter outlines the methodology used to understand EMA perspectives of preparing the public for mass evacuation. It will outline the risk that is the primary focus of planning and preparedness for each country participating in this research.

Chapter 4. Methodology

4.1 Introduction

The previous chapter examined the theoretical frameworks that will be used to interpret the findings of this research. This chapter outlines the methodological approach adopted to explore the four research questions that were outlined in Chapter 2. The first section of this chapter will reiterate the research questions and justify the methodology. The chapter will then discuss the research design including an explanation of the research setting and population, the data collection methods, and the timeframe for data collection. The third section of this chapter will outline the data analysis techniques and the emergent themes.

4.2 Selecting appropriate methodology to address the research questions

As outlined in Chapter 1, the focus of this PhD study was determined by the research undertaken for the ERGO project. ERGO was a three-year European Commission funded research project investigating how EMAs plan and prepare both themselves and the public for mass evacuation across ten countries. The research stream for this PhD is grounded in interpretivism. For interpretivists, *social reality is regarded as the product of its inhabitants; it is a world that is interpreted by the meanings participants produce and reproduce as a necessary part of their everyday activities together*" (Blaikie, 2009, p.99). As typical of interpretive approaches, qualitative methods including 74 semi-structured interviews, documents and observation were used to investigate how EMAs across Europe and Japan prepared their public for mass evacuation. This chapter will examine why this approach was deemed most appropriate to address the research questions outlined in Chapter 2 and below. As this research was cross-national, concerned with observing social phenomena across seven nations in order to understand how social processes operate (Hantrais, 1999), this chapter also addresses the challenges of conducting cross-national research and how these were resolved. It will also examine the ethical and practical issues associated with developing the findings for this research based on the 74 semi-structured interviews when the researcher led the public preparedness stream of questioning in 48 of the 74 interviews.

Robson (2002) outlines the importance of research questions in determining the research strategy and methods used. As outlined in prior chapters the aims of this thesis are to better understand EMAs' perspectives of preparing the public for mass evacuation and the distribution of responsibility for public preparedness. The four research questions that were developed to address these aims and that have guided the research are:

- How and why do EMAs influence the public to prepare for mass evacuation?
- How do EMAs distribute the responsibility for public preparedness?
- What are the benefits, barriers and risk factors for EMAs who utilise social marketing to influence their public's evacuation preparedness behaviours?
- What are the theoretical arguments that inform this area of enquiry?

The next section examines why the interpretive approach using qualitative methods was also deemed most appropriate to collect data to address the overarching aims and research questions that this thesis seeks to address.

4.2.1 Justifying the methodological approach

Deshpande (1983) argues that there is a strong link between research paradigm and the research methods used. The research paradigm is suggested to guide the researcher in their selection of research methods (Guba and Lincoln, 1994). The definition of paradigm can be traced back to Thomas Kuhn (1970) and his notion of a paradigm as a *“cluster of beliefs and dictates which for scientists in a particular discipline influence what can be studied, how research should be done, how results should be interpreted”* (Bryman, 1988, p.4). A paradigm consists of ontology (*“the “reality” that researchers investigate”*), epistemology (*“the relationship between that reality and the researcher”*) and methodology (*“the technique used by the researcher to investigate that reality”*) (Healy and Perry, 2000, p.119). The axiology (aim of the research) is also determined by the ontology (Lee and Lings, 2008). Two dominant paradigms are positivism and interpretivism (Hudson and Ozanne, 1998). The next section examines the suitability of each paradigm in relation to this research and the questions posed.

Although the term positivism is used in different ways (Bryman, 2004), it is commonly regarded as the ‘standard view’ of the philosophy of science. For positivists, *“the social world, like the physical world, also exists independently of individuals’ perceptions as a real, concrete and unchanging structure. Reality exists as a structure composed of relationships among its parts”* (Hudson and Ozanne, 1988, p. 509). Based on this assumption, positivists believe that reality is fragmented and can be measured accurately. They believe that the methods of the natural sciences can be applied to the social sciences as they make the assumption that science can be conducted in a value free and objective way where the research is not influenced by the researcher and the respondents taking part.

A generalizing approach is taken to research concerned with discovering general scientific laws that are context-free and that can be widely applied to a large number of situations (Hudson and Ozanne, 1988).

As positivist approaches are concerned with theory testing and the verification of hypotheses, quantitative methods such as surveys and experiments are typically used (Sobh and Perry, 2005).

However, the application of positivism in the social sciences has faced criticism from authors such as Healy and Perry (2000) who argue that positivist approaches are inappropriate for the social sciences which involves *“humans and their real-life experiences”* (p.119). Crotty (1998) further outlines how *“the scientific world”* addressed by positivists *“is an abstraction from the ‘lived’ world; it has been distilled from the world of our everyday experiences, distances us from the world of our everyday experiences, and takes us further still from the world of immediate experience lying behind our everyday experiences”* (p.28).

A positivist approach was deemed unsuitable for the PhD research as the research questions required data on EMAs *“real-life experiences”* of preparing the public. They required EMAs to both consider and reflect on how the public were prepared. Research methods associated with positivist approaches were considered inappropriate as they disregard contextual factors and the meaning and purpose of behaviour (Snape and Spencer, 2004). For example, as quantitative methods such as the survey interview are standardised with questions being predetermined in both their ordering and wording, researchers are unable to use probing questions to understand the meaning behind each response (Kvale and Brinkmann, 2009). The need to understand the context and meaning underpinning EMA perspectives was considered particularly important due to this research being cross-national. The researcher needed to be able to explore whether the meaning and application of public preparedness for mass evacuation varied or was common across the seven countries. However, as examined below, there are difficulties associated with understanding these issues in cross-national research. A positivist approach was also rejected due to the limited existing research on institutional perspectives of public preparedness. As there is limited existing research and the area is not well understood, it would have been difficult to test a theory or verify a hypothesis.

As outlined above, this PhD is grounded in interpretivism due to the research questions. Interpretivism *“emerged in contradistinction to positivism in attempts to understand and explain human and social reality. The interpretivist approach...looks for culturally derived and historically situated interpretations of the social life-world”* (Crotty, 1998, p. 66-7). Interpretivists do not view reality as objectively measurable but as subjective and interpreted by research participants (Lee and Lings, 2008). Interpretivism was considered appropriate for the PhD research as it enabled the researcher to focus on the meanings, interpretations and understandings EMAs had of public preparedness and how they

believe the public are being prepared across the seven countries. Blaikie (2000) outlines how interpretivists seek to understand “the social world” people create and which is continuously reproduced. “This everyday reality consists of the meanings and interpretations given by the social actors to their actions, other people’s actions, social situations, and natural and humanly created objects” (p.115).

Interpretivism is typically (although not exclusively) associated with qualitative research (Snape and Spencer, 2003). The next section examines why qualitative research was used.

4.2.2 The selection of qualitative research

Qualitative research is an inductive approach concerned with the generation of theory (Bryman, 2004). The use of qualitative research was considered most appropriate due to its interpretivist epistemological position which is concerned with the understanding of the social world (Bryman, 2004). Consistent with interpretivism, “the most fundamental characteristic of qualitative research is its express commitment to viewing events, actions, norms, values, etc. from the perspective of the people who are being studied” (Bryman, 1988, p.61). As outlined in Chapter 2, due to limited cross-national studies, this research focused on EMA’s perspective and their role in preparing the public for mass evacuation across seven countries. Ritchie (2003) suggests that qualitative methods should be the sole method to collect data when individuals or groups have a highly specialised role as there will be a need for responsive questioning.

Cresswell (2007) further outlines how it is appropriate to use a qualitative approach when an issue needs exploring, when there is a need for detailed understanding and when the researcher needs to understand the context. Qualitative methods were considered more appropriate as they provided the researcher with an “opportunity to ‘unpack’ issues, to see what they are about or what lies inside, and to explore how they are understood by those connected with them” (Snape and Spencer, 2003, p.27). Due to this research being cross-national, it was also important for the researcher to understand the context (Hantrais, 1999) as different countries had different experiences of disaster and were preparing their public for evacuation as a result of different hazard and threats. Miles and Huberman (1994) outline how a “feature of qualitative data is their richness and holism, with strong potential for revealing complexity; such data provide “thick descriptions” that are vivid, nested in a real context, and have a ring of truth that has strong impact on the reader” (p.10).

As the research questions explored an area with limited research it was important that the methods employed were flexible and allowed new insights to emerge from the data. Qualitative methods provide flexibility and enable the researcher to change direction more easily than when using quantitative methods (Bryman, 2004). This is also supported by Edmondson and McManus (2007) who argue that qualitative methods best suit studies with nascent theory. They suggest that for areas with limited research, qualitative methods such as “interviews, observations, open-ended questions and longitudinal investigations” should be used to provide rich and detailed data on the research issue (p.1162).

4.3 Selecting a research design to understand government perspectives of preparedness

The next sections will outline the research design used to collect data to address the research questions. Lewis (2003) identifies five key areas of research design. The development of the research questions has been explored above, however, the research setting and population, negotiation of research relationships, choice of data collection methods and time frame for data collection are outlined below.

4.3.1 Research design setting and population: selecting a research approach

There are three main research traditions in qualitative research; ethnography, grounded theory and case study (Robson, 2002). These traditions will now be examined in terms of their suitability for addressing the research questions. Creswell (2007) outlines how these traditions may be integrated within a single study. As outlined below, whilst a case study research design was predominantly used, the research also involved elements of focused ethnography and a modified version of grounded theory.

A case study research design was considered most suitable to address the research questions outlined above. Robson (2002) defines case study as *“a strategy for doing research which involves an empirical investigation of a particular phenomenon within its real life context using multiple sources of evidence”* (p.178). Case studies can be used to focus on phenomena such as behaviours and processes (Sarantakos, 2005) and to provide an understanding of *“everyday practices”* and the meanings that these practices hold to the people involved (Hartley, 2004, p.325). Hartley (2004) outlines how *“detailed case studies may be essential in cross-national comparative research, where an intimate understanding of what concepts mean to people, the meanings attached to particular behaviours and how behaviours are linked is essential”* (p.325). Thus, a case study research design was considered

most appropriate as this research focuses on the processes and practices EMAs use to influence the public to prepare for mass evacuation across seven countries and what the concept of public preparedness means to EMAs. The importance of considering context was outlined above in terms of each country having different experiences and preparing their public for different hazards and threats. Lewis (2003) highlights how their focus on integrating different perspectives “*means that case study designs can build up very detailed in-depth understanding. They are used where no single perspective can provide a full account or explanation of the research issue, and where understanding needs to be holistic, comprehensive and contextualised*” (p.52). A case study research design was also considered most appropriate as theory building is typically inductive with theories being developed through the combination of different pieces of evidence (Hartley, 2004). This feature of case studies was considered important due to the limited existing research on EMA’s perspective of public preparedness. Three criteria to determine whether case studies should be used are proposed by Yin (2009): that the research is concerned with how and why questions, that the control of behavioural events is not required and that the study focuses on contemporary events. Case studies were also considered appropriate as they met Yin’s (2009) criteria. The research questions are predominantly concerned with how and why questions, do not require the control of behavioural events and are concerned with contemporary events in that in recent years there have been many hazards and threats that have resulted in the need for mass evacuation. Whilst Yin (2009) and Eisenhardt (1989) adopt a positivist approach to case study research, the approach used in this research was grounded in interpretivism. Discussing research undertaken in the field of disaster management, Peacock (2003) highlights the need for “*more qualitative case study research...because of the insights, depth, and richness of perspectives it can provide*” (p.243).

Atkinson and Hammersley (1994) outline how an ethnographic approach can be taken when using a case study research design. However, mainstream ethnography was not an option as the researcher was not allowed the time necessary to observe and conduct ethnographic research to gain deep insight into the culture and structure of the social groups in each country (Robson, 2002). Hence for practical reasons the researcher did not have the time required in each location to explore and observe the culture of the institutions. The researcher adapted a focused ethnography approach to the research. This research is concerned with understanding the perspective of a raft of EMAs in different countries. Practically it was not possible “*to capture, interpret and explain how a group, organization or community live, experience and make sense of their lives and their world*” (Robson, 2002, p.89). In an ideal world, this would have been achieved through the researcher’s immersion within the cultural

setting (Scott Jones, 2010) in which EMAs prepare the public. Immersing herself within cultural settings is considered important but presents a practical problem in cross-national research the scale of ERGO. Creswell (2007) outlines how ethnography is an appropriate approach when there is a need to describe and interpret the shared values, beliefs, behaviours and language of a culture-sharing group. However, it was not feasible to study EMAs within their own country for more than three days due to this research being based on the ERGO project and the European Commission funding guidelines. Due to this restriction, the ethnographic approach adopted by this research was more akin to 'focused ethnography' (Knoblauch, 2005). In contrast to more traditional forms of ethnography, focused ethnography involves short-term field visits with intensive data collection and analysis (Knoblauch, 2005). Recording devices are used to record the large amount of data over a short period of time which then requires intensive data analysis. Due to the funding restrictions in place, focused ethnography with short-term field visits was considered appropriate for this research.

Grounded theory is an appropriate approach to use when there is not an existing theory explaining a process (Creswell, 2007). Approaches using grounded theory aim to *"generate a theory which relates to the particular situation forming the focus of the study. This theory is 'grounded' in data obtained during the study, particularly in the actions, interactions and processes of the people involved"* (Robson, 2002, p.190-191). Based on this feature, grounded theory appeared a suitable research design to address the research questions and to generate a theory of how the public are prepared for mass evacuation. Since its introduction in 1967, at least two versions of grounded theory have emerged (Goulding, 2002). Whilst *"Glaser stresses the interpretive, contextual and emergent nature of theory development...Strauss appeared to have emphasised highly complex and systematic coding techniques"* (Goulding, 2002, p.47). As this PhD research was based on the ERGO project, the researcher was unable to adhere to a fundamental principle of grounded theory that is common to both versions. In grounded theory studies sampling should not be specified at the beginning of the research as it is driven by the emerging theory (Goulding, 2000). This 'theoretical sampling' involves the collection, coding and analysis of data in order to determine the data that should be collected next (Glaser, 1978). The *"process of data collection is 'controlled' by the emerging theory"* (Glaser, 1978, p.36). However, in this PhD research, sampling was predetermined at the outset as it was restricted to the countries that the researcher had access to through the ERGO project. The constant interplay between data collection and conceptualization is also fundamental to grounded theory (Bryman, 2004). Due to the practical issues associated with conducting and transcribing interviews across seven countries, it was not possible to analyse the interviews through the constant comparison method. Whilst grounded theory

was not considered an appropriate research design due to this research being based on the ERGO project, the method used to analyse the qualitative data (Miles and Huberman, 1994) was informed by grounded theory. For example, the coding process adopted from Bryman (2004) was influenced by grounded theory.

4.3.2 The negotiation of research relationships

This section will first discuss the research team before moving on to outline the recruitment of the seven case studies.

4.3.2.1 The research team

As outlined above, the PhD study was based on the data collected for the three-year European Commission funded ERGO project. The ERGO team consisted of six people; three academic co-investigators and three doctoral researchers. Whilst all team members were based in the UK during the research, the team was international with members coming from the UK, India, Mexico and the USA. The ERGO team being international sought to minimise cultural bias in the design and research process. Hantrais (1999) outlines how researchers engaged in cross-national research “*may seek to analyse practices in different cultural settings through their own (inappropriate) conceptual lens*” (p.103).

The ERGO project was divided into three research streams with each doctoral researcher being responsible for one stream. Two streams examined how operational research models could support institutions in their planning for mass evacuation. The third stream, which this researcher was responsible for, focused on how institutions prepared their public for mass evacuation. Eisenhardt (1989) outlines how multiple investigators “*enhance the creative potential of the study. Team members often have complementary insights which add to the richness of the data, and their different perspectives increase the likelihood of capitalizing on any novel insights which may be in the data*” (p.538). In addition to the core team members, an external emergency management practitioner based in the UK regularly provided the team with expertise and guidance on the research.

As the sole researcher responsible for the research stream focusing on public preparedness, this researcher’s role on the project was to review the literature, develop the interview questions, analyse the data and disseminate the findings for this particular stream. During the semi-structured interviews, the researcher would lead on the public preparedness stream of questions whilst a fellow researcher would lead on the operational research questions. The processes used to develop the interview questions and analyse the data are outlined below. Throughout the project, this researcher would

regularly discuss the progress of her research and receive feedback from team members during regular meetings with the whole team or academic co-investigators. In addition to the responsibilities concerned with the public preparedness stream of research, the researcher also had responsibility for organising and leading the data collection visits in three countries. The next section outlines how the countries were selected.

4.3.2.2 Selecting the case studies

The selection of case studies was based on the researchers role on the ERGO project. A collective case study design (Stake, 2008) consisting of seven countries participating in the ERGO project was used to investigate EMAs' perspective of public preparedness. A collective study includes several instrumental studies whereby cases are "*examined mainly to provide insight into an issue...The case is of secondary interest, it plays a supportive role, and it facilitates...understanding of something else. The case still is looked at in depth, its contexts scrutinized and its ordinary activities detailed*", however, this is to investigate the external interest which in this case was public preparedness (Stake, 2008, p.123). The PhD research studied seven countries as it is difficult to build theory with less than four cases and with more than ten it becomes difficult to cope with the amount of data (Eisenhardt, 1989).

Purposive sampling was used to select the countries that comprised the case studies. The case studies were "*chosen with a 'purpose' to represent a location or type in relation to a key criterion*" (Lewis, 2003, p.79). Purposeful maximal sampling (Cresswell, 2007) in particular was used to select case studies that provided different perspectives on how the public are prepared for mass evacuation and how the responsibility for preparedness is distributed. The researcher had access to ten countries through her role on the ERGO project – Belgium, Bulgaria, Denmark, Germany, Iceland, Poland, Spain, Sweden, the United Kingdom and Japan.

Seven of the ten case studies were selected for further investigation. Spain was rejected for the PhD research as the data collection for this country was undertaken differently to the other countries in the form of two large focus group interviews and was also conducted in Spanish, therefore the researcher did not participate in this data collection visit. Whilst the researcher participated in the data collection visits to Bulgaria and Poland, the majority of data was collected in the interviewees' national language requiring translation. Due to the language barriers being significantly higher in these countries, Bulgaria and Poland were also not included in the PhD study. The PhD study therefore included Belgium, Denmark, Germany, Iceland, Sweden, the United Kingdom and Japan. The researcher did not add any additional countries due to time and resource constraints.

Yin (2009) highlights how key informants providing insights into the issue and who initiate access to evidence are critical to the success of a case study. Before any data was collected, an International Advisory Board was formed consisting of a senior government official from each participating country and the external emergency management practitioner discussed above who acted as the Advisory Board chair. The Advisory Board members acted as key informants providing guidance on the research design and access to the data in their respective countries. Mangen (1999) outlines how 'expert' interviews are common in cross-national research where 'experts' provide primary data, guidance and also act as *"a local gatekeeper to networks of appropriate informants"* (p.117).

The Advisory Board also provided guidance on the most appropriate level of government to focus the data collection visits on, based on existing public preparedness plans and activities in their country. For Japan, Sweden, Iceland and Belgium the visits focused on national government whereas for Denmark, Germany and the UK they focused on the regional or city level. However, in all countries data was collected from at least two levels of government (national, regional and/or local) in order to gain a holistic picture of how the public were prepared and how the responsibility for preparedness was distributed. Collecting data from at least two levels of government was considered important as *"an objection often raised to studies that take the nation as the unit of observation is that within-nation differences may be obscured"* (Hantrais, 1999, p.98). Including multiple levels of government enabled a broader perspective of public preparedness to be captured.

The recruitment of the seven countries through the ERGO project will be discussed before moving on to outline how and what data was collected. The countries were predominantly recruited by ERGO's academic co-investigators who visited or telephoned the key informant in each country to provide information on the project and to gain an understanding of mass evacuation planning (Shaw et al., 2011). Table 4.1 illustrates the risks that each country was preparing for and had experienced, the key informant and any key information. The information is deliberately not area specific in order to protect the anonymity and confidentiality of the key informants and interviewees. Table 4.1 and table 1.1 enables the similarities and differences in relation to risk between the countries to be compared. Øyen (1990) outlines how *"trying to understand and explain variation is a process which cannot be accomplished without previous reflections on similarities and dissimilarities underlying the variation"* (p.4). Analysing both tables shows the direct comparisons that can be made between countries. For example, Belgium and Sweden were both preparing for nuclear accident, had similar population sizes and the research was focused at the national level in both countries.

Table 4.1 The recruitment of the seven countries.

Country and (Research Focus)	Risks Preparing For	Previous Disasters	Key Informant	Key Information
Japan (National)	<ul style="list-style-type: none"> – Earthquakes – Tsunamis 	<ul style="list-style-type: none"> – Great Kantō earthquake (1923) – Kobe earthquake (1995) 	Academic and Disaster Management Advisor to different levels of government	<ul style="list-style-type: none"> – Only country outside of Europe – Benchmark case study – Leading expert in natural disasters (Baker, 2009).
Germany (State)	<ul style="list-style-type: none"> – Storm surge flooding 	<ul style="list-style-type: none"> – North Sea Flood (1962) 	Head of Civil Protection and Disaster Management	
The UK (City)	<ul style="list-style-type: none"> – Terrorism 	<ul style="list-style-type: none"> – Terrorism (2005) 	Head of Emergency Preparedness for a Blue Light Service and member of the city resilience team	
Sweden (National)	<ul style="list-style-type: none"> – Nuclear accident 	<ul style="list-style-type: none"> – Chernobyl nuclear disaster in the Ukraine (1986) 	Strategist for Nuclear Emergency Preparedness (Changed in the early stages of the research)	<ul style="list-style-type: none"> – In January (2009) the Swedish Civil Contingencies Agency (Myndigheten för samhällsskydd och beredskap, MSB) was established combining three authorities that had closed at the end of December 2008.
Belgium (National)	<ul style="list-style-type: none"> – Nuclear accident 		Coordinator of the Higher Institute of Emergency Planning, Belgium Crisis Centre	
Denmark (City)	<ul style="list-style-type: none"> – Terrorism 		Danish National Police	<ul style="list-style-type: none"> – Perceived increased risk of terrorism following a Danish newspaper publishing the cartoons mocking the Prophet Mohammed in 2005.
Iceland (National)	<ul style="list-style-type: none"> – Volcanic floods 	<ul style="list-style-type: none"> – Volcanic eruption (1973) 	The Icelandic Police, Department of Civil Protection and Emergency Management	

4.3.3 Data collection methods

There are a variety of different qualitative methods that could have been used to collect data to address the research questions. The four main methods for collecting qualitative data are “*interviews, observation, the generation and use of documents and visual methods*” (Mason, 2002, p.54). This study used a variety of methods as case study research involves collecting multiple sources of information (Cresswell, 2007). The suitability and selection of different methods is outlined below.

In-depth individual interviews were selected as the primary method of data collection. For Yin (2009), interviews are one of the most important methods to collect information for a case study. In-depth interviews were considered the most appropriate method for this research as they are consistent with the interpretivist research paradigm outlined above and are “*a very good way of accessing people’s perceptions, meanings, definitions of situations and constructions of reality*” (Punch, 2005, p.168). They enable the personal perspective of each person to be studied in detail and an in-depth understanding to be gained of the context in which a phenomenon occurs (Lewis, 2003). This was considered important as the researcher was interested in EMAs’ perceptions of how the public were prepared for mass evacuation and how the responsibility for preparedness was distributed due to the limited existing research from the EMA perspective. Selecting interviews as the predominant method of data collection enabled the researcher to use techniques such as probes “*to achieve depth of answer in terms of penetration, exploration and explanation*” (Legard et al., p.141).

In-depth interviews were also considered the most appropriate method of data collection as they provide the opportunity for clarification (Lewis, 2003). This was particularly important as the research was cross-national and involved multiple languages. In a cross-national study undertaken by Harding (1996), interviews were selected in order to reduce the impact caused by language barriers.

Semi-structured interviews rather than unstructured interviews were selected to gather data as they enabled the researcher to cover the same issues in each of the seven countries whilst also allowing new insights to emerge that could be followed up. Lee and Lings (2008) argue that in studies with multiple cases some degree of structure is required to ensure that interviews are comparable. Unstructured interviews were also rejected as Mangen (1999) advises against the use of highly unstructured interviews in cross-national research “*unless linguistic competence is extensive*” (p.117).

Although semi-structured interviews were considered a suitable method to collect data, the researcher also acknowledged the disadvantages of using this method. Robson (2002) highlights how interviews are time-consuming not only in terms of conducting the interview but also in terms of the time required

to schedule and prepare for interviewing and then transcribing and analysing the interviews. Interviews also have higher costs associated with them than other methods such as questionnaires (Sarantakos, 2005). The disadvantages of selecting interviews were also heightened as this research was cross-national, involving the collection of data from seven countries. The use of different languages across the seven countries could result in key terms being interpreted differently in each country. The risk of different interpretations was increased as the semi-structured interviews were predominantly conducted in English, a second language for the majority of interviewees. Highlighting the limitations of conducting interviews in English with foreign language speakers, Mangen (1999) outlines how *“respondents, typically have to make on-the-spot decisions about what is being asked of them, particularly where questions are open to several nuances, or contain linguistic ‘false friends’”* (p.113). Additional disadvantages of using interviews in cross-national research include how *“interviewing in a second language is strenuous”* and how interviews are predominantly *“non-repeatable”* (Mangen, 1999, p.117). The next section outlines how the researcher addressed the implications of interviewees being interviewed in a foreign language when designing and conducting the semi-structured interviews.

Participant observation is concerned with *“methods of generating data which entail the researcher immersing... [themselves] in a research ‘setting’ so that they can experience and observe at first hand a range of dimensions in and of that setting”* (Mason, 2002, p.84). Yin (2009) outlines how a case study taking place in its natural setting creates opportunities for direct observation. This research was conducted in natural settings as the team collected data during their field visits to the key informants and/or interviewees’ organisations. Consistent with the focused ethnography approach taken to the case studies, the researcher adopted a field-observer role (Knoblauch, 2005). Data gathered from observation can be used to complement the data gathered from the in-depth interviews and to confirm EMAs’ accounts of how the public are prepared for mass evacuation. The researcher acknowledges that her presence being made known to participants could have impacted upon what she observed. However, Robson (2002) highlights a positive benefit of observation in that; *“members of the group, particularly key informants, are led to more analytical reflection about processes and other aspects of the group’s functioning”* (p.317).

For case study research, documents have the important role of corroborating and augmenting the evidence collected from other sources (Yin, 2009). As many approaches to preparing the public focus on developing communications material, the researcher recognised that this type of document could form a vast amount of data. However, as this was one of government’s main techniques to prepare the

public, it was important to gain an understanding of them. Sarantakos (2005) also highlights how it is not always possible to make comparisons between documents. This was a pertinent issue in this research as many documents given to the researcher were in another language.

Focus groups were rejected as a suitable method to collect data to address the research questions. It is the generation of data and insights from the interaction between focus group participants that makes focus groups different from in-depth interviews (Finch and Lewis, 2003). Focus groups were rejected as the researcher required a detailed understanding of EMA's perceptions of preparedness and focus groups do not generate detailed data from individuals (Lewis, 2003). Focus groups were also rejected due to the requirement for confidentiality. Interviewees may have been reluctant to discuss their role in planning and preparing the public for mass evacuation with other levels of government or external organisations being present.

The above section has examined the methods that were selected to collect data and why these methods were used. The next section will outline the tools and processes that were used to collect data, the different types of data collected and a timeline of the research process.

4.3.4 The timeline of research and data collected

This section will first discuss the process used to develop the interview guide before moving on to outline the data collected across the seven countries.

4.3.4.1 Developing the interview guide

One of the researcher's first tasks was to design the interview guide that would be used to collect the data during the semi-structured interviews. For semi-structured interviews, an interview guide is a list of questions to be asked during the interview, however, there is flexibility in its usage (Bryman, 2004). The researcher used three sources to develop the interview guide as recommended by King (2004); the existing literature, the researcher's background knowledge and experience of the area and preliminary work including informal discussions with the Advisory Board Chair. The first draft included sixteen questions with prompts underneath particular questions that would require further probing based on the interviewees response. This first draft was revised following recommendations from all members of the ERGO team. Recommendations included significantly reducing the number of questions to enable interviewees to provide more detailed responses, creating a more logical structure, simplifying the language and wording of the questions as interviewees would predominantly be speaking English as a second language and making the questions less specific. The team also recommended that the

interviews should be designed to last no longer than one hour due to the important roles that the interviewees had and the demands of being interviewed in a foreign language. The first question covering the interviewee's interest in mass evacuation was designed so that an interviewee would be able to easily answer it (King, 2004). This first question and a further three remained in the second draft, however, the wording was changed to make them easier to understand. Based on the ERGO team's recommendations, five questions were removed as they were too specific and would have prevented interviewees from responding in detail. These five questions covered the interviewee's experience of the public mass evacuating, however, discussions with the team highlighted how rare mass evacuation was. Whilst an additional seven questions were also considered too specific, they were merged into three broader questions and additional prompts were included to remind the researcher to cover these areas.

The second draft of the interview guide included seven questions covering the interviewees' role and responsibilities, their perception of public preparedness and how the public are prepared for mass evacuation. This interview guide was pilot tested with the two ERGO doctoral researchers and a third doctoral researcher with significant experience of working in the UK Fire Service. This involved cognitive testing of the interview questions in order to identify any problems that interviewees may have in understanding and answering them (Beatty and Willis, 2007). The pilot interviews highlighted how the broader questions enabled interviewees to provide more detailed responses. They also highlighted the need to include an alternative set of questions for interviewees that did not prepare the public for mass evacuation but had an awareness of the approaches to public preparedness in their country. As the researcher was aware that she would not be present in every interview and that other team members would need to cover her interview questions, training and feedback was also provided to the two ERGO doctoral researchers. The researcher also observed one of the ERGO doctoral researchers pilot testing their interview guide with the Advisory Board Chair. Observing the interview provided the researcher with lessons on using the interview guide during an interview. For example, the researcher redesigned the interview guide to include space under each question to allow notes to be taken on the areas to probe further.

4.3.4.2 The Advisory Board and data collected

Following the country recruitment, a paper Advisory Board meeting was held with the key informants from each country. A document was emailed to the key informants before the first data collection visit to gain their feedback on the proposed research design. The document included information on the

structure of the field visits, the topics to be covered and the organisations to be interviewed. The team sought the key informants' feedback in order to ensure the research design was appropriate and in line with their expectations. This was important as the key informants were responsible for scheduling the interviews in their respective countries. Whilst new topics were incorporated (e.g. the evacuation of vulnerable groups and sheltering), no other changes were suggested. As the interview questions already included a question on the groups of the public that were targeted with preparedness approaches, no additional questions were added to the interview guide. However, a prompt was included under this question to remind the researcher to ensure that the topic of vulnerable groups was covered.

Whilst documents and contextual information were collected during the co-investigators visits to the key informants, the majority of data was collected during the field (i.e. data collection) visit to each country. Table 4.2 shows how the first data collection visit was in Germany. Whilst the interview questions were pilot tested, a pilot study was not undertaken before this first data collection visit, which is a limitation of this research. A pilot case study would have enabled the research team to identify the feasibility of the research proposal (Robson, 2002). However, funding and time restrictions meant it was not possible to conduct a pilot study. To ensure that the first data collection visit was conducted as planned and to address any problems identified, all members of the team and the Chair of the Advisory Board participated in the visit that was held in the key informants' workplace. At least two team members were present on every data collection visit to ensure their safety.

As recommended for case study research, the team requested that at least the first interview in each country was an "*orientation interview*" (Hartley, 2004, p.328). This is where the interview provides researchers with an overview of the organisational structure, its functioning and its history (Hartley, 2004). The orientation interviews were used to gather contextual information on the structure and history of emergency management and evacuation planning for each country. Six of the seven countries facilitated an orientation interview, however, one country refused as they believed that these areas had been covered during the first visit by the co-investigators. In the six countries, the orientation interviews involved the key informant and their colleagues presenting and answering questions on the structure of emergency management in their country, the organisations responsible for preparing the public and how they prepared the public for mass evacuation. Whilst the researcher had not planned for interviews with multiple interviewees, Lewis (2003) highlights how the overall research design is often modified as the researcher interacts with the research setting. These orientation interviews were in the form of "*group interviews*" whereby several interviewees were

interviewed at the same time (Sarantakos, 2005, p.269). They were not focus groups as they were not characterised by group interaction. The group interviews complemented the in-depth individual interviews by providing the researcher with background contextual information and a holistic understanding of public preparedness from multiple perspectives. This understanding was then followed up in-depth during the individual interviews.

Interviewees in each country were selected by key informants based on a list of organisations that the team had provided. Eisenhardt (2007) outlines how data collection approaches should use *“numerous and highly knowledgeable informants who view the focal phenomena from diverse perspectives. These informants can include organizational actors from different hierarchical levels, functional areas, groups, and geographies, as well as actors from other relevant organizations”* (p.28). The list of organisations that the team wanted to interview included the three different levels of government, emergency management organisations, emergency responders and NGOs.

The majority of interviewees spoke English as a second language. As the key informants organised the interviews, they had advance knowledge of the interviewees' level of spoken English. In the minority of cases where interviewees had a low level of spoken English, the key informants themselves acted as an interpreter. An issue associated with cross-national research related to language is how *“many concepts do not, however, travel well across national boundaries, and the question of the equivalence of concepts in different contexts has become a central issue in cross-national comparisons”* (Hantrais, 1999, p.104). Goulding (2002) also outlines the debates over whether researchers should conduct research in situations where they don't share the same language as those being researched. For example, Barnes (1996) argues that language barriers between the researcher and interviewee *“disarms a researcher's ability to assess meanings, intent, emotions”* (p.433). The researcher acknowledges that the language barrier between herself and interviewees may have resulted in difficulties for both parties in assessing the meaning of particular concepts. However, the use of key informants who were fluent in both their own language and English and who also had a detailed knowledge of the emergency management field, including this data was viewed as reducing this barrier. For Mangen (1999), *“one advantage of 'expert' interviews in cross-national research is that...the risk of linguistic or cultural distortion effects is smaller”* (p.117).

Yin (2009) outlines how there is a need to cater to interviewees' schedules when interviewing key persons. In three countries, interviews were not held as planned due to interviewees' schedules. As outlined in table 4.1, Sweden was undergoing a period of significant organisational change when the

field visit occurred. This change in organisational structure impacted on the data that the researcher was able to collect and as a result the number of interviews for Sweden was lower than any other country as the key informant experienced difficulties in scheduling interviews. The UK data collection visit fell on a period of significant snowfall which resulted in five interviewees cancelling their interview. Whilst two interviews were rescheduled, the researcher was unable to participate in these interviews and the other three interviewees were unable to reschedule their interviews. An interview that had been scheduled with local government in Denmark was also cancelled whilst the researchers were in the country and was unable to be rescheduled. As the interviewees for each country were based on the key informants' network of contacts and the interviewees' availability, it was not possible to consistently interview the three different levels of government, emergency management organisations, emergency responders and NGOs in each country. Whilst this is a limitation of the research, at least two levels of government were interviewed in each country to gain a holistic picture of public preparedness.

On the data collection visits to Germany and Belgium, this researcher was not present in every interview as two interviews were often conducted concurrently due to the high number of interviewees. Due to the timing of the Iceland data collection visit, the researcher was also unable to participate. Although the researcher was not present, the public preparedness questions were covered in every interview and all interviews across the seven countries were audio-recorded with the interviewees' permission providing the researcher with access to the data. The researcher has debated whether to include the data that she did not collect herself. The use of data by researchers who did not collect the data themselves has been questioned due to their lack of understanding of the context in which the data was gathered (Hammersley, 1997). A knowledge of the context in which data is gathered is key to the process of understanding interviewee's meaning (Moore, 2006). Whilst the researcher did not have direct knowledge of the context, the ERGO team provided contextual information in team meetings and discussions and in data analysis sessions. Her colleagues had also been fully briefed and trained in conducting interviews, had been present in interviews the researcher had conducted and had received weekly updates on the researcher's thesis. If the researcher identified a need for further information after listening to an interview she was not present in, there was also the opportunity to ask further questions by telephone or email. Therefore, it was decided to include the interviews based on the additional value they add to the findings.

A summary of the interviews held in each country is outlined in Table 4.2. Seventy four interviews were held with interviewees working in different levels of government and organisations responsible for

emergency management. The table also highlights the interviews where the researcher led the public preparedness stream of questioning and the interviews where she was not present. The implications of analysing data that the researcher did not collect herself will be discussed further below.

Table 4.2 Summary of the data collection visits.

Country, Location of Visit & Interviewers	Date of Visit	Organisations Interviewed	The researcher led the public preparedness stream of questioning	Not present in	Total
Germany Key informants organisation Team members All researchers, co-investigators and the Advisory Board Chair	23 rd to 26 th November 2008	<ul style="list-style-type: none"> – Regional government* – Local government* – Red Cross* – THW - Federal Agency for Technical Relief – Malteser* – Fire department* – University – Public transport* – Local Port Authority* – Environment Agency 	8	6	14
Sweden Key informants organisation Team members Two researchers	26 th to 28 th January 2009	<ul style="list-style-type: none"> – National government* – Regional government * – County Administrative Board (Local level)* – National communications* 	5	0	5
UK Key informants organisation Team members All researchers and one co- investigator	3 rd to 5 th February 2009	<ul style="list-style-type: none"> – National government* – Regional government* – Regional ambulance* – National transport* – Regional transport* – BBC* 	6	2	8
Belgium Key informants organisation Team members Two researchers and one co- investigator	8 th to 10 th October 2009	<ul style="list-style-type: none"> – National government* – Regional government* – Local government – National police* – Regional communication* – National communication* – National Fire Service* – Regional Police Service* – University* 	11	5	16

Country, Location of Visit & Interviewers	Date of Visit	Organisations Interviewed	The researcher led the public preparedness stream of questioning	Not present in	Total
		<ul style="list-style-type: none"> – Red Cross – Civil Protection – Medical Services – Public Transport* 			
Denmark Key informants organisation Team members Two researchers	30 th March to 1 st April 2009	<ul style="list-style-type: none"> – National government* – Regional police* – Local police* – Foreign office* – Public transport* 	10	0	10
Japan Multiple emergency management organisations Team members Three researchers and one co- investigator	13 th to 23 rd April 2009	<ul style="list-style-type: none"> – National government* – Regional government* – Local government* – National Fire Agency* – University* 	8	0	8
Iceland Key informants organisation Team members Two researchers and one co- investigator	27 th to 29 th May 2009	<ul style="list-style-type: none"> – National government – Local government – The Icelandic Red Cross – The Icelandic Coast guard – The Ambulance providers and fire service – Icelandic Association for Search and Rescue (ICE- SAR) – The Icelandic Road Administration – Traffic police – University – Meteorological Office 	0	13	13
Total			48	26	74

** indicates the interviews where the researcher led the public preparedness stream of questioning.*

In addition to the audio-recordings of the interviews, the researcher also collected data using “*informal observation*” (Robson, 2002, p.313). This involved making notes on the information that she gained from interviewees and the activities organisations undertook to prepare their public for mass

evacuation. For example in Japan officials provided a tour of educational facilities that had been created for the general public to inform them about risks such as earthquakes and tsunamis and their associated hazards (e.g. fire). The researcher was able to observe school children participating in preparedness activities such as a simulation of an earthquake and also participate in them herself. In the UK, the researcher also participated in evacuation training and a military exercise concerned with planning and responding to different incidents. Observing and participating in the activities provided the researcher with a better understanding of how organisations prepare for mass evacuation. However, informal observation was not undertaken in Iceland as the researcher did not participate in this data collection visit. For Iceland, the researcher relied on the feedback from the ERGO team on the observations that they had made.

Mason (2002) distinguishes between documents that exist prior to the research and documents that are created during the research. Both types of document were used during this study. During the first visits to key informants and the data collection visits, documents were provided by key informants and interviewees that supplemented the interviews. The researcher received different types of document including communications materials that are distributed to the public, emergency plans, legislation, government reports and training materials provided to other organisations responsible for preparing the public. Whilst the researcher was not present in all interviews, all documents collected by the team were discussed and were held in a central location for accessibility. During the interviews, interviewees also mentioned relevant documents that provided further contextual information. The researcher accessed these documents after the interviews to enhance her understanding. For example, one UK interviewee referred to the Pitt Review, a review of the 2007 UK floods which included 92 recommendations. This was followed up as the interviewee had discussed how the recommendations included making the public more responsible for their preparedness.

Key documents that were generated during the research included a 'country pack' that was created for each country prior to the data collection visit. Each pack provided detailed information on the key informant and their organisation, the interview schedule, the country, past evacuations and incidents and any plans or materials covering public preparedness. The country packs were critical in helping the researcher to understand the context of public preparedness in each country, which was particularly important for Iceland, the data collection visit the researcher did not participate in. A database of the interview recordings for each country was also created.

Between March and September 2010, after the interviews and additional data had been analysed and the researcher had gained an understanding of how EMAs prepare their public, each country was revisited. The purpose of revisiting each country was to both provide feedback on how the seven countries were preparing their public for mass evacuation and gain interviewees feedback on the findings. The feedback visits were organised by key informants and many of the attendees at the feedback visits had been interviewees. Whilst the feedback visits were an informal method of data collection, they did provide the researcher with an opportunity to capture any missing information. Due to the timing of the feedback visits, the researcher attended the visits in Germany, Belgium, Denmark and the UK.

4.3.5 Ethical Issues

It is vital to consider ethical aspects of the research design in the early planning stages (Robson, 2002). The ethical issues associated with this research were considered when submitting the research to Aston University's Ethics Committee, who approved the proposal. Lewis (2003) discusses four elements of ethics that any research study may raise; informed consent, anonymity and confidentiality, protecting participants from harm and protecting researchers from harm. Two additional ethical elements of this particular research study included issues associated with conducting cross-national research and analysing data that had not been collected by the researcher. This section outlines how the researcher addressed these elements.

4.3.5.1 Informed consent

As outlined above, before key informants agreed to participate they were provided with detailed information about the research either in person or by telephone. This included information on the purpose of the research, how the data would be used and what would be required of them. Mason (2002) outlines how consent may be renegotiated. Key informants were informed that they could leave the study at any time, which occurred. Finland agreed to participate in October 2008, however, in January 2009 as the data collection visit was being planned, the key informant decided to leave the research due to limited resources.

The team also requested that key informants provided the emergency management representatives in their respective countries with information before they consented to be interviewed. Immediately before interviews commenced, the purpose of the research and how the interview data would be used

were again explained to interviewees. Verbal consent was sought and granted for both participating in the research and having the interview audio recorded.

4.3.5.2 Anonymity and confidentiality

Interviewees were informed that any information that may reveal their identity would be removed from documents and that it would not be possible for people to identify them in the research outputs, with the exception of the research team and key informant. As key informants scheduled the interviews and in some cases were present in them, they would have known the identity of interviewees and may be able to attribute quotes to an individual. Although in some cases the research was conducted at a regional or city level, all cases are discussed as countries. The cities and regions have not been revealed to protect the identity of interviewees and so that quotes cannot be attributed to individuals. All data processed has conformed to the 1988 Data Protection Act and has been stored securely in a locked office and on a password protected computer.

4.3.5.3 Protecting participants from harm

The research topic was mass evacuation which may have been a sensitive issue for interviewees discussing incidents that had resulted in fatalities and/or destruction. When incidents were discussed, the researcher paid close attention to any signs of interviewees showing discomfort as advised by Lewis (2003). For example, when conducting interviews in Germany and Japan the researcher was particularly sensitive when evacuation as a result of finding World War Two bombs was discussed.

The researcher also paid attention to interviewees showing discomfort when discussing information that may pose a security risk if released into the public domain. In some cases interviewees stated that certain information was confidential and should not be used.

4.3.5.4 Protecting researchers from harm

To maximise her safety when collecting data from the seven countries, the researcher always travelled and collected data with at least one other researcher. All of the interviews were organised by the key informants and were predominantly held in government offices adding another element of safety.

4.3.5.5 Additional ethical concerns

In addition to the four common elements of ethics discussed by Lewis (2003), this study also raised additional ethical concerns that are discussed below.

An ethical issue associated with cross-national research, referred to briefly above, is whether research participants in each country attach different meanings and interpretations to a concept (i.e. public preparedness). This issue termed "*the problem of equivalence*" is concerned with whether a concept that is compared in different countries is the same or holds equivalent significance and meaning for the research participants in the different countries (Etzioni-Halevy, 1990, p.118). The difficulties of achieving conceptual equivalence have been highlighted by authors such as Teune (1990), Hantrais (1999) and Mangen (1999). However, Quilgars et al. (2009) argue that whilst establishing conceptual equivalence in quantitative research is important, "*qualitative research has an opportunity to elaborate and understand the meaning of key concepts, including hidden national assumptions*" (p.23). As this research was grounded in interpretivism and was therefore concerned with understanding the meanings EMAs attached to the concept of public preparedness in each country, establishing conceptual equivalence was not deemed necessary. The role of the key informants also assisted in ensuring that the key terms used would be understood by interviewees.

The second ethical issue arising from this particular research study was that the researcher was not present in 26 of the 74 interviews analysed. Whilst the researcher did not collect data in 26 interviews, it is debatable whether the analysis of these interviews can be categorised as secondary analysis which is defined by Bryman (2004) as "*the analysis of data by researchers who will probably not have been involved in the collection of those data for purposes that in all likelihood were not envisaged by those responsible for the data collection*" (p.201). Although many of the ethical issues associated with conducting secondary analysis do not apply as the data was collected for the same purpose and within the existing research project, there are some ethical issues that do apply.

Confidentiality is an ethical issue associated with using data that a researcher did not collect themselves (Bryman, 2004). However, this issue was addressed as the team informed all interviewees before the interview commenced that that the audio-recordings would be shared and analysed by all members of the research team and gained interviewees' verbal consent to do this.

It has also been questioned whether a researcher can use qualitative data that they did not collect without having the background knowledge, rapport with the interviewees and "*the essential contextual experience of 'being there'*" (Corti et al., 2004, p.295). Discussing qualitative research, Heaton (2004) further outlines how "*the interpretation of data is generally perceived to be dependent on the primary researcher's direct knowledge of the context of data collection and analysis obtained through their own personal involvement in the research*" (p.30). Although the researcher did not participate in 13

interviews across Belgium, Germany and the UK, she did lead the public preparedness stream of questioning in 25 interviews across these three countries. Therefore, at a country level the researcher was both personally involved in the research and gained knowledge and experience of the context of data collection in these countries. As the researcher did not participate in the data collection visit to Iceland, she did not directly experience the context of data collection, however, contextual knowledge was gained through reading Iceland's country pack, the information and debrief provided by the members of the team who collected the data and subsequent meetings with Iceland's key informant. The next section will outline how the data collected by both the researcher and by other members of the team was analysed and how the researcher addressed the issues associated with analysing cross-national data and data that she had not collected herself.

4.4 Data analysis

The data collection methods outlined above resulted in 1,646 pages of transcript. An external transcription service used by Aston University transcribed the audio recordings. To ensure that confidentiality was not broken, the service was briefed about the requirement to maintain confidentiality and protect the identity of interviewees. The service was also an approved supplier of Aston University. In addition to the transcripts comprising the main body of data, the researcher also had handwritten notes from the interviews, observations of activities related to public preparedness and numerous documents. This section outlines the techniques that were used to analyse this data. Bogdan and Biklen (1982) distinguish between analysis that occurs in the field and analysis that occurs after the data has been collected. The next section outlines the analysis that occurred in the field.

4.4.1 Analysis in the field

The researcher employed Bogdan and Biklen's (1982) strategy of "*constantly engaging in preliminary analytic strategies during data collection*" (Bryman and Burgess, 1994, p.7). The main preliminary analytic strategy adopted was to make comprehensive handwritten notes during interviews, meetings and any activities, which were used by the researcher to identify initial themes and ideas. These notes were continuously reviewed in order to identify areas to explore in subsequent interviews. Bryman and Burgess (1994) highlight how note taking is not only a method to collect data but also "*an important location for formal and informal analysis through commentary and coding*" (p.11).

Another strategy used was that of regular debriefs in between the data collection visits. After each visit the researcher updated the team on the themes emerging from her research. For the ERGO project the

researcher also had to write an interim summary of the key lessons learnt for each participating country. Whilst not consciously undertaken as a “preliminary analytic” strategy this assisted the researcher with understanding the different themes that were emerging and the links between them.

As the researcher was not present in 26 interviews, she was unable to analyse these interviews whilst in the field. By not being present, she was also unable to gain experience of the field and the tacit knowledge gained by her colleagues (Weaver and Atkinson, 1994). For researchers, data collection not only produces field notes and audio recordings *“but also implicit understandings and memories of what they have seen, heard, and felt, during the data collection process”* (Hammersley, 2010). The debriefs after each data collection visit and data analysis sessions with the ERGO doctoral researchers were used to provide the researcher with a general understanding of their experience of the interviews that she was not present in.

The next section outlines the analysis that occurred after data collection, which for Bogdan and Biklen (1982) is concerned with developing a system of coding the data.

4.4.2 Analysis after data collection

Yin (2009) suggests “playing” with the data as a starting point for data analysis and refers to a number of techniques proposed by Miles and Huberman (1994). Their approach to data analysis is also highlighted by Robson (2003) who outlines how *“Miles and Huberman (1994) provide an invaluable general framework for conceptualizing qualitative data analysis. It is particularly useful in case studies”* (p.473). The transcripts and handwritten notes, forming the main body of data, were analysed using the framework and techniques proposed by Miles and Huberman (1994) through a process of: *“data reduction, data display, and conclusion drawing/verification”* (p.10). This process involved the common features of qualitative data analysis: *“coding, developing themes, and providing a visual diagram of the data”* (Creswell, 2007, p.173).

The researcher did not strictly adhere to Miles and Huberman’s (1994) structured approach to qualitative data analysis due to the conflict between the researchers’ epistemological beliefs and the realist position of Miles and Huberman’s (1994) approach (Robson, 2002). Miles and Huberman (1994) themselves outline how;

“Our view is that sharing more about our craft is essential, and that it is possible to develop practical standards – workable across different perspectives – for judging the goodness of conclusions... the overall structure of the text allows for some techniques to be used and others to be left aside” (p.5).

Yin (2009) also highlights how the techniques proposed by Miles and Huberman (1994) are not mutually exclusive and how any number of the techniques can be used in any combination. The process used to analyse the data is outlined in detail below. Although a grounded theory research design was not employed in this research, the next section will outline how the coding process used was informed by grounded theory.

4.4.2.1 Coding to reduce the data

The first activity undertaken to reduce the data was coding. Coding is a process whereby codes are applied to different size portions of the data such as words, sentences or paragraphs (Miles and Huberman, 1994). Each code was used to capture the meaning of the data that it was applied to (Lee and Lings, 2008).

Miles and Huberman (1994) recommend that researchers should *“always code the previous set of field notes before the next trip to the site”* (p.65). Due to the high number of interviews held across seven countries at the key informants’ convenience, it meant that the coding of interviews was not possible in between data collection visits. However, as the researcher made detailed handwritten notes that were reviewed between visits and had continuous access to interviewees to follow up new insights, this was not considered an issue.

There are different approaches that can be taken to coding, from creating a start list of codes before fieldwork commences, to waiting for the field notes to highlight codes (Miles and Huberman, 1994). For ERGO, a *“provisional “start list” of codes”* (Miles and Huberman, 1994, p.58) was developed by the team using the project proposal, literature and handwritten notes. This “start list” of codes was revised as the team applied them to the transcripts (Shaw et al., 2011). This was undertaken during data analysis sessions where at least two researchers met to discuss how they had coded an interview transcript. Any discrepancies in coding would be discussed and the codes modified or redefined if considered necessary. Although this approach was used for ERGO, the researcher was not comfortable using it for her PhD research and preferred to reanalyse the data using a more inductive approach whereby the codes were generated from the data (Lee and Lings, 2008). Miles and Huberman (1994) themselves outline how *“a more inductive researcher may not want to precode any datum until he or she has collected it, seen how it functions or nests in its context, and determined how many varieties of it there are. This is essentially the “grounded” approach”* introduced by Glaser and Strauss (1967) (Miles and Huberman, 1994).

The researcher followed the coding process outlined by Bryman (2004) which is informed by grounded theory. Adopting this approach, each transcript and set of handwritten notes was initially read three times, twice to understand the different issues that were emerging. As Agar (1980) recommends this was for the researcher to *“immerse [herself] in the details, trying to get a sense of the interview as a whole before breaking it into parts”* (p.103). On the third read the researcher went through the data, highlighted any relevant text and started the coding process by making notes on significant observations in the margin. For the interviews where the researcher was not present and did not have handwritten notes to code, she also listened to the audio recordings and discussed them with members of the team to familiarise herself with the context. The data analysis sessions that had been held with the team also helped the researcher to understand the context and meanings of the interviews she had not experienced. The researcher was also cognisant of the need to focus on the meanings and interpretations of public preparedness across each country. As the data was coded the researcher continuously reviewed the codes that had already been applied and that were being applied to the data. In some instances codes were deleted, merged or had to be redefined. The researcher also began to develop *“general theoretical ideas”* about the data (Bryman, 2004, p.409). Similar to grounded theory’s axial coding (Strauss and Corbin, 1990), this involved consideration of the links between the concepts and categories that were being developed and their relationship to the existing literature. Coding the data in this way helped the researcher to better understand EMAs’ perspectives of preparing the public for mass evacuation and how the responsibility for public preparedness was distributed. Although the interviews had been conducted cross-nationally and there were interviews that the researcher had not conducted, the coding process resulted in the emergence of themes that were common to all seven countries. For example, the influence of risk was found to be a key theme in all seven countries.

However, coding is only one stage of data analysis and the researcher still needed to interpret the findings (Bryman, 2004). The next sections outline the techniques that were used.

4.4.2.2 Data displays

One of the techniques for examining data identified by Miles and Huberman (1994) is the creation of data displays (Yin, 2009). A display is *“a visual format that presents information systematically, so the user can draw valid conclusions and take needed actions”* (Miles and Huberman, 1994, p.91). The researcher developed data displays to draw *“descriptive conclusions”* (Miles and Huberman, 1994, p.90) on: how and why EMAs influence the public to prepare for mass evacuation, how the responsibility for

public preparedness is distributed and how social marketing is used by EMAs to prepare the public. Creating displays for the coded data enabled the researcher to both understand these areas for each country and also to make comparisons across the seven countries.

Two different data displays were produced to examine the coded data. Both data displays were “conceptually ordered displays” whereby the data was ordered by the themes that had been generated through the coding process (Miles and Huberman, 1994, p.127). The first data display was produced for each country in order to understand the different meanings each country attached to public preparedness. Each display provided information on the name of the theme (e.g. the responsibility for public preparedness), the reference to the source (e.g. the specific interviewee) and the data related to the theme (e.g. the quotation). Figure 4.3 provides an example of two rows taken from the first data display that was created for one country.

Table 4.3 An example taken from the data displays produced for each country.

Theme	Interviewee	Data
Public responsibility for their preparedness	Interview 1	<i>“Our messages, you are the first protector or your security. You have to do that, to protect the outside, to protect your family...Because in '99, 1980, all of the authorities say to the public don't worry be happy, the authorities do all of the things. It's not true. And now we are saying, okay you are the first actor of your security. It's then if you want to be a good man, you have to protect yourself, protect your family, to act correctly and so on.”</i>
	Interview 5	<i>“It is also a responsibility of the people and that's something we really have to stress because people they will not think, I have my responsibility. They really expect that everything will be arranged, will be organised that they don't have to do anything.”</i> <i>“So we call it what can the people do themselves? We start to say that the government cannot solve everything. It must be clear for the people also.”</i>

Displaying the data as in Figure 4.3 enabled the researcher to understand the data from different interviewees in one country related to each theme identified. The researcher found this first display particularly useful for understanding the themes for a particular country. As this research was cross-national, the researcher considered it particularly important to use direct quotes in order to retain as much of the interviewees meaning as possible.

In order for the researcher to be able to easily compare and contrast the data across countries, a second data display (Figure 4.4) was created. This display included the seven countries across the top row and the different themes and sub themes identified from the coding in the left hand column. If a country's first data display indicated that a theme was prevalent, an X would be marked in the relevant cell on the second data display. For example, Figure 4.4 illustrates the themes identified in each of the seven countries related to institutional preparedness roles. The second data display enabled the researcher to quickly identify the themes in each country and across countries, however, the researcher would always refer back to the first data display and original transcript when analysing the data to ensure that the interviewee's meaning was not lost as the data was further reduced.

Table 4.4 Illustrates the second data display created.

Country	Belgium	Denmark	Germany	Iceland	Japan	Sweden	UK
Theme: Institutional Preparedness Roles							
National government as coordinator	X	X		X	X	X	X
Local government as preparer	X	X		X	X	X	X
Non-governmental preparedness tasks		X	X	X		X	X

4.4.2.3 Drawing meaning from the data displays

Miles and Huberman (1994) propose thirteen "tactics" for drawing meaning from data displays. However, Robson (2002) outlines how several tactics *"reveal Miles and Huberman's direct translation of concepts from quantitative analysis into qualitative analysis. Several qualitative researchers may well view this as inappropriate. However there is no requirement to take these tactics en bloc"* (p.483). The particular tactics that the researcher considered appropriate and therefore used to draw meaning from the data displays are outlined below.

During the process of coding the data and developing the data displays, the researcher identified and documented any *"recurring patterns, themes, or "gestalts", which pull together many separate pieces of data"* (Miles and Huberman, 1994, p.246). Notes were made on any patterns or themes that were identified and on any links between codes.

Clustering (grouping categories with similar characteristics) was also used to better understand how the public were influenced to prepare for mass evacuation and how the responsibility for public preparedness was distributed. For example as Figure 4.4 shows, different institutions had different

types of role in preparing the public and these roles were clustered together under the theme of institutional preparedness roles.

The coding and data displays were used to compare and contrast the themes that were identified across the seven countries. Making contrasts and comparisons enabled the researcher to highlight any differences in approach across the seven countries and the reasons for these differences. It also enabled the key themes that were common to all countries to be identified such as the influence of knowledge, risk and responsibility on EMAs approaches to public preparedness.

During the data analysis process there was also the need for themes and codes to be reconsidered by the researcher. In some cases, a theme originally thought to be related to one area had to be split into two themes or codes. Miles and Huberman (1994) refer to this splitting of one theme into two as *"partitioning variables"* (p.254). For example, the researcher originally identified three different practices used to prepare the public, however, deeper analysis revealed that one of the practices identified actually encompassed two different types of process and therefore was split into two.

The final *"tactic"* used to draw meaning during the data analysis process was the *"subsuming of particulars into the general"* which is concerned with asking *"What is this specific thing an instance of? Does it belong to a more general class?"* (Miles and Huberman, 1994, p.255). This tactic is described by Miles and Huberman as *"a conceptual and theoretical activity (Glaser, 1978) in which you shuttle back and forth between first-level data and more general categories that evolve and develop through successive iterations until the category is "saturated" (p.256).* For example national government's coordination role and use of legislation, guidance and training identified that there was a higher level process occurring of responsibility being transferred down from national governments to local governments, a process termed *"top down responsabilization"*.

4.4.2.4 Analysing the documents

As outlined above, the majority of countries either provided the researcher with a variety of documents or discussed documents during the interview that the researcher later followed up. These documents were analysed using the process of document analysis discussed by Bowen (2009). This process *"involves skimming (superficial examination), reading (thorough examination), and interpretation [and]...combines elements of content analysis and thematic analysis"* (Bowen, 2009, p.32).

The first activity involved reviewing each document to identify the documents that included relevant data (Bowen, 2009). A minority of documents including incident and organisational reports were

disregarded at this stage as they did not contain any content on public preparedness. Due to limited resources the researcher was also forced to disregard any documents that were not written in English unless they had been discussed during an interview. The predominant focus on documents written in English and lack of analysis of documents written in a foreign language is a limitation of this research.

After selecting the documents to undergo a more thorough analysis, the researcher re-read the selected documents and on the second read, the codes that had been created to analyse the interview transcripts and handwritten notes were applied to the documents. As typical of case study research, coding the documents using the pre-existing codes enabled the researcher to augment the findings that had been identified during the process of analysing the interview transcripts and handwritten notes (Yin, 2009).

Bowen (2009) further outlines how researchers need to understand the meaning of the document and how the document contributes to the research issues. This includes considering the purpose of the document and the target audience. In the majority of cases, the meaning of the document was discussed directly with interviewees during the semi-structured interviews. The researcher would explore the documents development, purpose and target audience with interviewees and gain a brief overview of its content. As this was discussed during the interviews, the data was analysed as described above, using the techniques proposed by Miles and Huberman (1994).

4.4.3 Verifying the quality of the research

This section outlines the activities undertaken by the researcher to ensure that the data generated and analysed was both valid and reliable. Easterby-Smith et al. (2002) outline how *“there has been some reluctance to apply ideas of validity and reliability to interpretative and social constructionist research, because they might imply acceptance of one absolute (positivist) reality”* (p.54). Although this view exists, authors such as Easterby-Smith et al. (2002), Robson (2002) and Padgett (1998) have proposed strategies for increasing the validity and reliability of qualitative research. The strategies adopted by the researcher are outlined below.

To address the issue of reliability, Easterby-Smith et al. (2002) suggest that the research methods used should be transparent:

“It is very important for the researcher to explain how she gained access to the particular organization, what processes led to the selection of informants, how data was recorded, what processes were used to summarize or collate it, how the data became transformed into tentative ideas and explanations, and so on” (p.55).

To increase the reliability of her research, the researcher has outlined above how access was gained to interviewees, how informants were selected, how the data was recorded and the process used to analyse the data.

The researcher used strategies suggested by Padgett (1998) to resolve the threats to the validity of her research (Robson, 2002). The case studies of government organisations involved prolonged involvement with each country over a period of three years. Prolonged involvement may reduce the threats to validity suggested by Lincoln and Guba (1985) of “*reactivity, respondent biases and researcher biases*” (Robson, 2002, p.172). Observer triangulation (Denzin, 1998) was also used as more than one researcher was present in the majority of interviews. Fellow researchers were used for “*peer debriefing and support*” (Robson, 2002, p.175). Regular meetings involving debriefs were held following each data collection visit which is suggested by Robson (2002) to reduce researcher bias. This was considered particularly important due to this research being cross-national and the risk of researchers viewing the data from their own cultural perspective (Hantrais, 1999). A report and presentation was also given to key informants on how the seven countries were preparing their public for mass evacuation. Whilst this was for ERGO and focused on the strategies countries were using to preparing their public, it provided key informants with the opportunity to provide feedback on the researcher’s interpretation.

4.5 Conclusion

This chapter has outlined the methodological approach used to explore EMAs’ perspectives of preparing the public for mass evacuation. It has demonstrated how an interpretivist approach using qualitative research methods was best suited to addressing the aims of this thesis.

A case study approach consisting of seven countries was employed to gain an in-depth understanding of the behaviours and processes EMAs use to influence the public to prepare and to distribute the responsibility for preparedness. Semi-structured interviews, documents and observation were used to collect qualitative data from the seven countries. The chapter outlined the implications of conducting cross-national research and using data that was not collected by the researcher and how these were implications were addressed.

The data collected was analysed through a process of “*data reduction, data display and conclusion drawing/verification*” (Miles and Huberman, 1994, p.10). Data analysis and the initial stages of writing up revealed that the findings fell into two main categories, which form the subsequent two chapters.

The next chapter, Chapter 5, outlines the findings on how public preparedness is governed at an institutional level. Chapter 6 examines the findings on the practices EMAs use to influence the public to prepare for mass evacuation.

Chapter 5. Segmented Preparedness: Responsibility, Risk and Knowledge

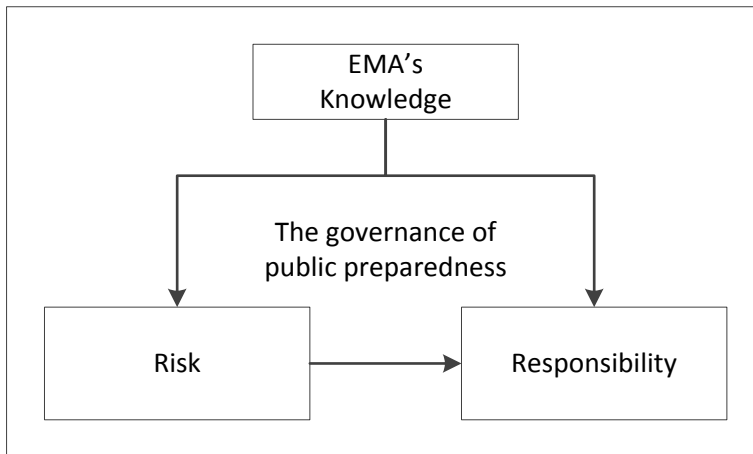
5.1 Introduction

This chapter outlines the findings on how interviewees governed public preparedness. It is based on the analysis of 74 interviews across seven countries with representatives from different levels of government and organisations responsible for emergency planning and preparedness. In order to illustrate the diversity of perspectives, the findings will cover multiple units of analysis. The chapter will highlight the variations and tensions in how public preparedness is governed across the seven countries and also across the different levels of government and organisations.

As illustrated by Figure 5.1, the findings show that there were three main influences on how public preparedness was governed: responsibility, risk and EMAs knowledge. The chapter will show how these influences resulted in a segmented approach to preparedness with particular levels of government and organisations preparing the public in particular areas for particular risks. In brief, the chapter will examine;

- Responsibility - the distribution of preparedness responsibilities between different levels of government and organisations resulted in an inconsistent approach to preparedness. Critically, as preparedness approaches were dependant on the activities of local governments, interviewees believed that the public living in different areas had different levels of preparedness. [section 5.2]
- Risk – in all countries, different types of risk determined the particular groups of the public that were prepared. Risks becoming disasters resulted in changing emergency management systems and responsibilities. Based on their disaster history, countries had different levels of maturity in their experience of preparing the public. For man-made risks, interviewees preferred to focus on crisis communication as this type of risk was considered more politically ungovernable due to the uncertainty surrounding the response and a fear of scaring the public. [section 5.3]
- Knowledge – EMA's knowledge determined how governable different types of risk were and the type of risk that interviewees prepared their public for. In a situation where there was a lack of knowledge of a particular risk, evacuation was more difficult when the incident occurred. Preparedness responsibilities were distributed to local governments and organisations considered to have the knowledge required to perform preparedness tasks. [section 5.4]

Figure 5.1 The influences on how public preparedness is governed and their relationship



In order to provide contextual information, the next section will first outline the findings on how the responsibility for public preparedness was distributed. The chapter will then move on to illustrate the influence that risk and EMA's knowledge had on the distribution of preparedness responsibilities and on how public preparedness was governed.

5.2 Dividing responsibility: top down, bottom up and organisational

This section examines the findings on how the responsibility for public preparedness was distributed between different levels of government and organisations. The section will first outline how in the majority of countries national governments used legislation, guidance and/or training to transfer the responsibility for preparing the public down to local governments. It will then examine how this top down responsabilization was accompanied by a bottom up desire for national governments to take a greater role in preparing the public. It will also discuss how the responsibility for public preparedness was divided with particular organisations being allocated particular responsibilities to prepare the public. The section will show how this distribution of the responsibilities for public preparedness resulted in a lack of a consistent approach to preparedness. It will also highlight how a key finding of this research is that the ways in which the responsibilities for public preparedness were distributed resulted in interviewees believing that different segments of the public had different levels of preparedness for different risks.

5.2.1 Top down responsabilization

The majority of interviewees across the seven countries discussed the emergency management responsibilities that different levels of government and organisations had. Emergency management

operated across three levels; national, regional and local, also referred to as federal, provincial, and municipal levels respectively. The evidence below shows that whilst each level of government had emergency management responsibilities, the responsibility for public preparedness was predominantly transferred down to local governments. It shows how higher levels of government provided a coordination and guidance role indicating a top down responsabilization approach. As responsibility had been devolved and public preparedness relied upon the practices used by each local government or organisation, there was a perception that levels of preparedness were different across different segments of the public in the majority of countries.

Higher levels of government (i.e. the national or regional levels) were viewed by interviewees in all seven countries as providing a coordination role over the different organisations involved in preparing the public. The majority of interviewees working in higher levels of government discussed how they had *“to coordinate or manage... many organizations effectively”* including governmental agencies, NGOs, *“scientists...[and] university researchers”* (Interview Japan.37). Their role was to *“manage...all the organizing authorities who work together, [they had] to manage it [and] put everything together”* (Interview Germany.24). Higher levels of government were responsible for *“harmonising the emergency planning at all levels”* (Interview Belgium.3). This included *“coordinat[ing]...the local government[s]”* (Interview Japan.39) and acting as *“an umbrella over the local authorities”* (Interview Iceland.31). However, in the majority of countries higher levels of government did not *“inform the public that much. [They] coordinate”* (Interview Sweden.59).

Interviewees in six countries outlined how *“the responsibility [to prepare the public] is on the municipal”/local level* (Interview Sweden.57). However, in one country the responsibility for *“catastrophe prevention [including public preparedness] is on the state [i.e. regional] level”* (Interview Germany.27). *“The prevention, preventative campaigns... That’s mostly the [local areas] which are responsible for that”* (Interview Belgium.3). The responsibility had been transferred to *“local responders [who had] to make the public aware of the risks in their area and to inform them what they are prepared to do should an event occur”* (Interview UK.63). *“The local...staff [had the responsibility to]...setup different contingency plans and workout how to do emergency preparedness within the district”* (Interview Denmark.19). *“Local governments [were] in-charge of civil protection measures...in their distinctive areas”* (Interview Japan.36). However, as outlined below, local governments were only responsible for preparing the public for particular risks.

In the six countries, interviewees discussed how legislation, guidance and/or training were used to transfer this responsibility to local governments. Legislation transferred responsibility by stating the responsibilities and duties that local governments legally had to perform to prepare their public. This included *“legislation...which really stresses that in case of emergencies that there is a responsibility...on a community level”* to prepare the public (Interview Belgium.5). *“The law [required that] there should be a local crisis cell [that] should prepare”* (Interview Belgium.12). Laws also required local governments to make preparedness plans. *“Based on...Act[s]...the municipality government[s had to] develop their civil protection plan[s]”* (Interview Japan.34).

“The...Act places a duty on responders...and they are responsible for doing local planning...Within a local resilience forum, they will have to identify all the hazards and threats within their area and then plan for how they would respond to those events and that includes issues such as warning and informing the public” (Interview UK.63).

National government interviewees in the six countries also discussed the guidance and advice that they provided through their coordination role. As part of this role, national governments were *“there to guide and inform [local governments] planning and also to ensure that the requirements under the Act are met”* (Interview UK.63). By interacting with local governments, national governments were able to identify areas that they needed to provide guidance on. This included *“writing...a multi-disciplinary manual on emergency planning...because [they] see all sorts of trainings. It was asked to provide training at a local and provincial level”* (Interview Belgium.3) and *“help[ing]...people in municipalities...how to work with preparedness on a day-to-day basis”* (Interview Denmark.19).

“So we’re constantly talking to, meeting with, be it informal conferences or formal structured regular meetings that we have with [lower levels of government]...We knew vulnerable people was an issue for a period of time and therefore we took it upon ourselves to bring a group of experts from local level to throw down ideas. From that, we drafted a guidance, bounced it back off them and opened it up to a bit of a wider group and then basically wrote the guidance from there” (Interview UK.61).

Whilst the responsibility for preparedness was transferred to local governments, national governments continued to guide how the public were prepared. They would *“give the information to the community levels [who would then] have to spread out all the information that they have or that they receive from [higher government]”* (Interview Belgium.5). If higher levels of government had *“some information that [they] want[ed] to [give] to the public in advance, [they] inform [ed]...the municipality”* (Interview Sweden.56). Thus, the *“measures”* taken by local governments to prepare the public should have been *“based on basics developed by the national [and regional] governments”* (Interview Japan.36).

A minority of national government interviewees in the two countries preparing for nuclear accident (Belgium and Sweden) provided training on communicating with the public to local governments. One interviewee organised a *“three day course on crisis communication running every spring and every fall where all the preparedness officers and information officers come”* (Interview Sweden.59). In Belgium,

“We give training...each year we give training in crisis communication. Media training and so on. And then it’s for all of the crisis communicator...Then I got see... fifty crisis communicator of local authorities to talk about the crisis communication...we are going to...help this person to prepare themselves to prepare the commune with the crisis communication plan” (Interview Belgium.1).

By training local government employees and providing them with the skills to communicate more effectively with the public, national governments in the two countries were transferring the responsibility for communicating with the public. Whilst the quotes above refer to crisis and not risk communication, it will be discussed below how countries preparing for particular types of risk focused predominantly on crisis communication and how risk communication was a new area for some interviewees on which they had limited knowledge.

In addition to transferring responsibility, training local governments to communicate with the public would have enabled national governments to guide how their local governments communicate with the public. Higher levels of government were using tools including legislation, guidance and training to both transfer responsibility to local governments and at the same time to guide how local governments prepared the public, if they prepared the public at all as outlined below.

5.2.1.1 Different localities with different levels of public preparedness

As evidenced below, this research found that the distribution of responsibility for public preparedness resulted in a belief that different segments of the public had different levels of preparedness for different risks. This may be attributed to the inconsistent approaches to public preparedness highlighted by interviewees.

Whilst national governments attempted to guide how local governments prepared their public, the responsibility had been transferred to local governments. As the responsibility had been transferred, how the public were prepared would rely on how national government guidance and legislation was interpreted by each local government and the activities undertaken to prepare the public. Whilst local governments made preparedness information *“available to the public, how the public knows depends on the area depending on how much pre-education the local responders do”* (Interview UK.63). As local

responders had the responsibility for public preparedness, *depending on the...locality, the degree of preparedness may be different*" (Interview Japan.35).

Interviewees in five countries (Belgium, Denmark, Germany, Sweden and the UK) discussed how different areas had different levels of public preparedness suggesting that this responsibility had been interpreted differently in different areas. They explained how *"many people living... in this area know about this leaflet, they know about the dangers... For [other areas]...this is not the case"* (Interview Germany.25). Knowledge varied by area with *"the regions [being] different, more and more different regions differ[ed]"* in terms of their awareness of the risk (Interview Belgium.5). In a particular *"part of [the] country, people are...more obvious of siren warnings and things like that"* (Interview Denmark.19). *"The people ...nearby the plant...know what the story is"* (Interview Sweden.60).

Despite national governments coordination and guidance role, interviewees in three of these five countries (Belgium, Sweden and the UK) discussed the lack of a consistent preparedness approach across different areas. In these countries, local areas prepared the public *"individually...there aren't any common initiatives towards the public...[They] do some things, but it doesn't come together"* (Interview Belgium.12). *"Every [local area]...will interpret and have [a] different approach"* (Interview Belgium.7). Preparedness practices were viewed as *"not really [being] united. [The] different people working with the information...are really working apart and haven't yet gone together, discussed and got a good organisation"* (Interview Sweden.60). Whilst *"there might be some really red hot ideas in [one area]..., it doesn't necessarily get shared elsewhere"* (Interview UK.62). Thus, *"people will not be consistently prepared for what to do"* when an incident does occur (Interview UK.64).

For the two countries that did not discuss differing levels of preparedness (Iceland and Japan), a handful of interviewees believed that the public in their countries were prepared. *"The people who live in Iceland they know about the danger of these things, volcanoes and earthquakes and so on...The people in Iceland know about it"* (Interview Iceland.45). Interviewees highlighted how *"because [their] country has so many disasters...disaster preparedness is a part of...common sense...people do share the feeling that we should prepare"* (Interview Japan.35). These countries were considered to *"have a generally well educated public"* (Interview Iceland.44). However, as will be examined further below, all countries prepared their public for particular risks.

5.2.1.2 Responsibilizing whilst retaining control

Interviewees in three countries (Denmark, Iceland and the UK) discussed how national governments use their role of coordinator to oversee and assess the work of local governments. National governments required local governments to provide information on how they had met their preparedness responsibilities. One interviewee discussed how national government “*run[s a] ...National Capabilities Survey, every two years...And it goes out to [local government], 1,200 people*” (Interview UK.61). In one country,

“What they have to do is that, they have to sit down and make...a contingency plan for the whole municipality, which is based on the risk, the specific risk that this municipality is facing. Then they have to get the plan approved by [a national level government organisation]”
(Interview Denmark.19).

Whilst only discussed by a minority of interviewees, national governments surveying and assessing the work of local governments would encourage local governments to undertake the responsibilities transferred down to them as they would know that they were to be assessed on how they had met these responsibilities.

5.2.2 Bottom up responsabilization

The findings also indicated discontent in how the responsibilities for public preparedness were distributed. As illustrated below, whilst there was a desire for national governments to increase their responsibility for public preparedness, national governments preparing for particular risks held negative attitudes towards public preparedness. Thus, the distribution of responsibility not only resulted in the perception of different levels of public preparedness but also different attitudes to public preparedness across the different levels of government.

In addition to the responsibility for preparedness predominantly being transferred down to local governments, a minority of interviewees in three countries (Belgium, Germany and the UK) also expressed a desire for national governments to take a greater role in preparing the public. They discussed how national governments were not doing enough to prepare the public. “*At times [they] don’t feel Government are prepared to go as far as they could do, in briefing the population at large on emergencies*” (Interview UK.64). One interviewee explained how national “*government says, no, we shouldn’t tell the [public]...you should tell them that everything is correct and... safe... Yeah, well it’s too short-sighted actually. So, I see my responsibility there...to say come on this is not acceptable, you have to change*” (Interview Germany.29). They believed that “*the Government must explain what they are doing...that’s one of the things which isn’t aware*” (Interview Belgium.6). For these interviewees, the

division of responsibility between levels of government was not working as they believed that national governments needed to take more responsibility for preparing the public. Although only expressed by a handful of interviewees, the desire for responsibility to shift upwards suggests that there needs to be greater balance in the division of preparedness responsibilities between different levels of government.

National governments and politicians were also viewed as preventing interviewees from fulfilling the duties that they both needed and wanted to undertake to prepare the public. Interviewees wanted national governments to retain some of the responsibility for public preparedness whilst also giving lower levels of government greater freedom in what they were allowed to do to prepare their public. Thus, responsibility for preparing the public had been transferred down to local governments, however national governments and politicians continued to guide and in some cases restrict how the public were prepared for mass evacuation.

“One of the greatest problems that we’ve always had is we’ve had a lot of operational plans that we’ve got...but unless you tell the general public, they won’t know. The Government has always been reluctant to tell the public; we can’t understand this... We...were quite prepared to...[perform a particular activity to prepare the public]... Government wouldn’t allow it” (Interview UK.66).

“I know that there is a lot of countries with special website about crisis risk. How to prepare, how to be prepared and so on. We started. We want to do that, but it’s always a problem with the... not the political but the strategic things, is it good or not for the public?” (Interview Belgium.1).

These views were supported by approximately half of the national government interviewees in countries planning and preparing for the man-made threats of terrorism or nuclear accident (Denmark, Sweden and the UK). They were *“personally not that much into this pre-learning educative school”* and were reluctant to prepare the public as they believed that it is *“difficult to raise awareness and to educate people about risks in society”* (Interview Sweden.58). There was a perception that interviewees were *“not going to have the impact [on public preparedness] pre-event”* (Interview UK.62) and that if they *“hand them [preparedness information] now...when it finally happens [it will be in] a bottom of a drawer somewhere, they really don’t know where to find that”* (Interview Sweden.56). These views were also supported by a regional level interviewee in a country also preparing for a man-made risk (Belgium). This interviewee believed that the public should not receive a nuclear brochure before an incident occurs as *“people wouldn’t know what to do with it and when it’s so far [away]...they don’t find it”* (Interview Belgium.8).

Thus, these interviewees held negative attitudes towards preparing the public as they believed that their actions would not have any influence on public preparedness. However as further examined below, the negative attitudes held by interviewees in higher levels of government were predominantly based on the type of risk that the country was preparing for.

5.2.3 Organisational responsabilization

Not only was the responsibility for public preparedness divided between different levels of government, it was also divided and allocated to particular organisations, predominantly governmental agencies and NGOs. Interviewees in the majority of countries (Denmark, Germany, Iceland, Sweden and the UK) discussed how specific organisations had particular preparedness responsibilities such as preparing the public for particular risks in particular geographic areas and/or for performing particular preparedness tasks. For example, particular organisations were made *“responsible for the nuclear preparedness and the chemical preparedness”* (Interview Denmark.21). These organisations were *“only responsible for nuclear”* with the responsibility for other risks being held by other organisations, *“so it’s split up who is responsible for certain things”* (Interview Sweden.57). A particular organisation *“focuses on flooding”* (Interview UK.63). Organisations were also made *“responsible for [preparing the public in] this area”* (Interview Germany.28) and were given particular preparedness tasks such as one organisation that was *“ordered to make out public information about the sirens”* (Interview Denmark.20). Interviewees discussed how they *“have contracts...with [specific NGOs] to do those things”* (i.e. undertake particular preparedness activities) (Interview Iceland.45).

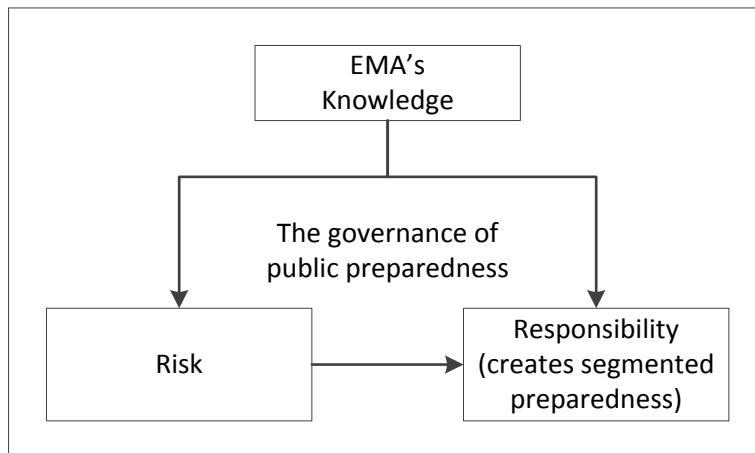
As outlined above, the responsibility for preparing the public was divided between different levels of government. However, the findings also indicate that specific organisations were responsible for preparing for particular risks, particular geographic areas and undertaking particular preparedness tasks. Thus, in the majority of countries the concept of preparedness was segmented.

This segmented preparedness may have resulted in the different levels of preparedness discussed by interviewees. For example, due to the focus on preparing for flooding in one country, an interviewee outlined how, *“for the cases of floodings, [the public] are well-prepared”* however the same was not said concerning their preparedness for other incidents (Interview Germany.30). Whilst in another country, it is nuclear that is *“the only disaster that is really well anticipated”* (Interview Belgium.2). Interviewees also highlighted different levels of preparedness and awareness of risk across different areas. They reported how *“it differs from area to area. [In this area] people are very-very sensitive and know a lot about flood[ing]...but here they are a little bit different”* (Interview Germany.15). It is *“the*

ones in the [nuclear risk] zone [that]... *feel lots about this exercise and the preparedness plans*” however this was not the case for people outside of the risk zone (Interview Sweden.59). *“If we are talking about the people living behind the dykes [in a particular area], they would know a lot of things before, because it is necessary”* however it was not considered necessary for other areas to have the same knowledge (Interview Denmark.23). The implications of preparing particular segments of the public for particular risks are explored further below.

The above sections have shown how a key finding of this research is that the ways in which the responsibilities for public preparedness were distributed between different levels of government and organisations resulted in an inconsistent approach to preparedness and a belief that segments of the public had different levels of preparedness for different risks. The first section of this chapter focused on the responsibilities element of Figure 5.2 first in order to provide contextual information on the responsibilities and how they were distributed. The next sections will explore the other elements of Figure 5.2 and how risk and EMA’s knowledge influenced both how public preparedness was governed and the responsibilities for public preparedness.

Figure 5.2 The influences on how public preparedness is governed and their relationship



5.3 Risk: a segmented approach to preparedness

This section will illustrate how a key finding of this research is how risk contributed to the segmented preparedness approach outlined above. Risk played a key role in determining the segments of the public that were prepared for mass evacuation and the types of incident that they were prepared to respond to. The section will also show how risks becoming disasters resulted in new emergency management systems and responsibilities. As countries had different experiences of making changes in response to disasters, there were differences in the maturity of preparedness across the seven

countries. The section will also highlight how man-made risks are considered more difficult to prepare the public for due to the particular issues associated with preparing the public for mass evacuation in response to man-made threats. It will outline how a key finding of this research is the critical role that risk had in determining the appropriateness of preparing the public for mass evacuation, as mass evacuation is not an appropriate response in particular situations.

5.3.1 Risk based preparedness

This first section on risk will outline how risk was used to govern planning and preparedness. Rather than preparing for all hazards and threats equally, it will also show how interviewees focused on preparing particular segments of the public considered at risk.

5.3.1.1 Preparing the public for different hazard/threat risks

In all countries, interviewees working in different levels of government planned and prepared for particular risks. Risk assessments were undertaken in the majority of countries (Belgium, Denmark, Iceland, Japan and the UK) to identify and determine the risks that would become the focus of planning and preparedness. Interviewees were *“working so much with risk-based analyses”* (Interview Denmark.23). *“Risk Assessments show[ed interviewees]...the biggest risk. [They were] using the Risk Assessment to see [the] biggest mass evacuation drivers and therefore, what kind of evacuation are [they] needing to prepare for?”* (Interview UK.61). National governments had their own *“national risk assessment process”* (Interview UK.63) and were *“putting together a general picture for the whole country”* (Interview Iceland.32). They also provided *“guidance...for local risk assessment and regional risk assessment”* (Interview UK.63). This guidance included *“develop[ing]...risk identification, risk analysis and management know how for local...authorities”* (Interview Belgium.3). Thus, guidance from national governments enabled *“the locals [to] put... together a scenario or a risk assessment for themselves”* (Interview Iceland.32).

Interviewees outlined how local preparedness planning was based on the risks identified from conducting the risk assessments. For interviewees, *“the whole process of Local Risk Assessment...ensures that people are horizon scanning at a local level, know what their likely risks are”* (Interview UK.61). Risk assessments were used as interviewees *“want[ed] to prepare people for...the incidents that are likely to occur”* (Interview Denmark.23). Once the risk assessments had been conducted, local governments then had *“to come up with the risk-based contingency plan for the [area]”* (Interview Denmark.19). The requirement for local governments to conduct risk assessments to

determine the risks that the public were prepared for meant that local governments only prepared their public to respond to the particular risks that were identified in their local area. *“Based on the risk assessment result...[local] government[s]... establish[ed] a promotion plan to construct a disaster resistant city”* (Interview Japan.38). Interviewees discussed how *“very much the plans are in response to a particular risk that [has been] identified”* (Interview UK.62). Whilst a formal process for assessing risk was not discussed in one country, interviewees outlined how when a risk was identified they *“have to prepare some procedures for information”* (Interview Germany.30). Thus, the public were not prepared equally for all risks (i.e. generic preparedness) but were prepared for particular risks. The local risks identified included natural hazards such as flooding, volcanoes and earthquakes and the man-made threat of nuclear accident.

Whilst risk assessments were used to select the risks that the public were prepared for, one interviewee preferred *“generic planning”* and expressed concern regarding the use of risk assessments as the basis of preparedness planning, commenting how *“it’s a political desire to have these risk registers, but...to some extent they are quite dangerous, because what if something else happens?”* (Interview Denmark.22).

As outlined above, the responsibility for public preparedness was transferred to local governments. However, only the responsibility for preparing the public for particular risks was transferred. For one country (Belgium), the main responsibility for informing the public about nuclear risk was retained by national government. *“The federal government...they inform the people about nuclear risks every five years”* (Interview Belgium. 5). Nuclear is *“defined on which level... [it needs] to be planned and coordinated...It’s at the national level”* (Interview Belgium.3).

Local governments had responsibility for preparing the public for the particular risks that were identified by conducting the local risk assessments. A risk that local government interviewees did not discuss preparing their public for was terrorism. The responsibility for preparing the public for terrorism had not been transferred to local governments as no interviewee identified terrorism as a local risk that they were preparing the public for. It will be examined below how due to the higher uncertainty associated with the man-made risks of terrorism and nuclear accident, higher levels of government preferred not to prepare the public for these types of risk but preferred to focus on communicating with the public once an incident occurred. Thus, interviewees did not focus on preparing the public for all risks equally but focused on preparing them to respond to particular risks. This may explain the perception that segments of the public had different levels of preparedness for

particular risks. As interviewees were using a segmented preparedness approach focusing on preparedness for particular risks, the public may only be preparing for these risks.

5.3.1.2 Preparing the public living in particular geographic at risk areas

As governments were preparing the public for particular risks, they also focused on planning for the evacuation of and preparing groups of the public living in the geographic area where the risk was considered likely to occur. In all seven countries, plans and the preparedness practices outlined in the next chapter focused on particular geographic areas that were considered at risk from a particular hazard or threat. They focused predominantly on *“the people living in the dangerous areas”* (Interview Germany.26). For example, interviewees preparing for nuclear accident focused on the public living within a particular mile parameter around the nuclear plant and had *“plans for the inner zone and...must be capable to evacuate the inner zone fast and efficiently and in good co-operation with the public”* (Interview Sweden.57). Similar to nuclear zones, *“particular areas [regulated by Control of Major Accident Hazards (COMAH)]...have...very clear plans around evacuation... And...very clear messages for the public”* (Interview UK.62). Interviewees in all countries also discussed how they targeted particular at risk areas. It was *“the [risk] zone that decides what [preparedness materials] the...[public] will have”* (Interview Sweden.57). Interviewees outlined how they *“start[ed]...getting...the people where they live. In which area are there risks?”* (Interview Belgium.5). Groups of the public facing *“a real danger that they are likely to experience a number of times”* were targeted with interviewees preparedness approaches (Interview Denmark.23). Local governments would identify *“what areas in their villages have the most risks and then give...leaflets [and target] the people there”* (Interview Belgium.5). Interviewees *“check...the twelve thousand streets in [a city], if there is a street in the endangered area...[the brochures] have to be given out”* (Interview Germany.28).

Thus, interviewees used risk as a geographic boundary designating which segments of the public would be targeted. As evidenced in the next chapter, those members of the public who did not live within the geographic boundary of risk were not targeted. Using risk as a geographic boundary to determine who to prepare may also have resulted in the perceptions that different segments of the public had different levels of preparedness. Interviewees acknowledged the implications of only preparing segments of the public living in particular geographic areas. They discussed how *“the people that live close to [the particular risk] have information. They are very good how and where they should evacuate...but it might be different if you want to evacuate for other reasons and other places”* (Interview Sweden. 60). Interviewees believed that members of the public living outside the risk area, and therefore not the

target of government's preparedness efforts, would be unprepared if an incident occurred. They had targeted *"the...danger areas [with preparedness information]... So, people in the other areas will not know what will go on if there would be an order [to] evacuate"* (Interview Germany.27). Rather than creating segments of the public with different levels of preparedness, one interviewee outlined how *"everybody should know what they have to do when there is a crisis...It would be useful to inform everybody to prepare themselves for when they have to evacuate, because it could happen to everybody, not only those people who live in the area of a [risk]"* (Interview Belgium.2).

Interviewees may have focused on preparing segments of the public considered at risk rather than the entire population due to the financial and time resources required to undertake preparedness activities. Interviewees in four countries (Denmark, Germany, Sweden and the UK) discussed how *"the difficulty with...this sort of thing is its cost makes it difficult to maintain the kind of visibility that you would like to"* (Interview UK.62). In one country, *"just the printing of the brochure... and the delivering to everyone costs about 50,000 Euros for the [risk area]...And, we have no money"* (Interview Germany.25). Interviewees working in higher levels of government in three countries discussed how *"you always have to take into consideration if you want to do an information campaign on something, what are the costs and what are the benefits [of] this campaign"* (Interview Denmark.23). They were concerned with *"ensuring...that there is the cost benefit balance"* (Interview UK.61). *"Where is your limits with the information...you can go...absurd and inform everybody and sometimes you have [to] look... [at the] cost benefit"* (Interview Sweden.60). For an interviewee in one country, *"it's more a problem of time. We don't have time. We want to do a lot of thing[s] but we don't have time. We are two person"* responsible for crisis communication (Interview Belgium.1). It may be due to the financial and time costs required to prepare the public that interviewees used the segmented preparedness approach focusing on only preparing the public living in areas considered at risk. For the public in the risk area, the benefits of being prepared are considered to be more likely to be realised due to the higher level of risk in the area.

5.3.1.3 Preparing vulnerable at risk groups

In addition to the segmented preparedness approach focusing on preparing the public for particular risks and preparing the public in particular at risk areas, it also included a focus on particular groups of the public considered to be at higher risk. Interviewees in the majority of countries (Germany, Japan, Sweden and the UK) discussed how during their planning, they identified members of the public that they considered as particularly at risk (i.e. vulnerable) to the impact of a hazard or threat. Elderly and

disabled people were viewed as being particularly vulnerable and therefore required special consideration during the planning stage. This research found that interviewees considered and prepared this vulnerable segment of the public differently to the general public.

As the next chapter examines, responsibility was not transferred to all segments of the public equally as governments did not transfer the responsibility for preparing to elderly and disabled people.

Governments and NGOs retained some of the responsibility for the preparedness of elderly and disabled people through the creation of lists indicating the individuals who may need additional assistance and support during an evacuation. Interviewees discussed how vulnerable *“people [such as those] who are blind... are registered at the NGOs because there exist plans for the NGOs in case of evacuation how to bring these people out”* (Interview Germany.28). In these countries, *“staff...have the names of all the people who have a handicap and people who need special care from the society...[they] have a list of people who need special care”* (Interview Sweden.57).

“Since 2004 we [are] really focusing on elderly population. So, being elderly almost synonymous with having almost all kinds of disability...And, as a very direct reaction to new rising concern, almost every municipalities are now trying to prepare a list of those who are vulnerable, as a kind of basis to take actions at the time of evacuations” (Interview Japan.35).

Guidance had also been disseminated by the national government of one country to support their local governments in creating these lists of vulnerable people. They *“produced...Finding Vulnerable People in a Crisis, a...document...which is all about principles of creating lists of lists”* (Interview UK.61). Although the creation of lists of vulnerable people were not discussed in three countries, interviewees in two of these countries did outline how vulnerable people were considered. In one country, *“the town council computer program would tell [interviewees] if they have people who needs day care here, if people are confined to bed or need special assistance”* (Interview Denmark.16). Interviewees in another country also outlined how risk assessment guidance provided to local governments *“stress[ed] that they’d have to think of all the people in that district...so people have to think about the sick and all kinds of disabled people and children, the old people, foreigners. [They] have to look at the whole of society. [They] are not allowed to forget”* (Interview Iceland.32).

Whilst the next chapter examines how the responsibility for preparedness is being transferred down towards the public, the transfer of responsibility for elderly and disabled people is more complex as governments and NGOs are retaining responsibility for the preparedness and response of vulnerable groups through the creation of lists. However, the creation of segments of the public with different

levels of preparedness, including segments that are unprepared, may increase the proportion of the public that are vulnerable should there be a need for mass evacuation.

This section has illustrated the influence that risk had on how public preparedness was governed. It has shown the critical role that risk has in the segmented preparedness approach identified by this research. By preparing the public in particular areas for particular risks and by retaining responsibility for vulnerable groups, interviewees were not preparing the public equally for mass evacuation.

5.3.2 A reactive response to disaster

This second section on risk will first outline how emergency management systems and responsibilities were re-evaluated as risks became disasters. It will highlight how there were differences across countries in the maturity of emergency planning and preparedness and how countries preparing for natural hazards had a longer history of enhancing their emergency planning in response to incidents. It will then move on to show how some interviewees preferred to communicate with the public in response to an incident that had already occurred rather than in advance. However, as evidenced below, this preference for communicating after an incident had occurred was driven by the type of risk that the interviewee was preparing for. This research found that the type of risk was critical in determining the appropriateness of preparing the public for mass evacuation, as for man-made risks mass evacuation is not always the correct response.

5.3.2.1 Emergency management evolving through disasters

This section will discuss the findings for individual countries in order to provide important contextual information. In all countries, national governments had a reactive relationship with disaster. As risks became a reality in the form of disasters worldwide, national governments identified the need to change existing emergency management systems and in some countries also re-evaluated the responsibilities for emergency management. Disasters in interviewees own countries and abroad such as the Chernobyl nuclear accident in 1986, the terrorist attacks in the USA on September 11th, 2001 and the Indian Ocean tsunami in 2004 were catalysts for change as they highlighted problems with the existing approaches and the need to improve them.

In four countries (Germany, Japan, Iceland and Sweden) interviewees discussed how internal and international disasters that occurred over twenty years ago had resulted in changes to emergency management. Interviewees in these countries discussed a longer history of making changes in response to disasters. Japan discussed the longest history of changes being made as “*the Kanto*

earthquake...occurred in 1923...so...every year on that day, we have a national drill. All the national government agencies will participate in it and local government also" (Interview Japan.35). Icelandic interviewees also discussed a long history of emergency planning as *"when [the volcanos] erupted in 1973, 5000 [people] had to be evacuated from the islands...so...the first response plans...[were] formulated"* (Interview Iceland.31). Both Japan and Iceland were also the only countries to discuss actual experience of mass evacuation. Whilst Iceland evacuated 5000 people in 1973, mass *"evacuation...occurred [in response to the] Kobe earthquake...People evacuate[d] for several months in a shelter"* (Interview Japan.35). In Germany, *"1982 was the beginning of [the] new disaster management ...After this disaster, [they] got new systems"* (Interview Germany.26).

"That had been a starting point for a lot of things afterwards...due to the Chernobyl accident [in 1986]. This legislation was changed afterwards. The [emergency management organisation] started and was given responsibility, very much due to the fact of the Chernobyl... it was an awakening alarm" (Interview Sweden.59).

Changes in response to more recent disasters were discussed by interviewees in three countries (Belgium, Iceland and the UK). The disasters highlighted how *"the situation was not good enough...[and the] need... to review everything"* (Interview Iceland.33). As outlined above and in Chapter 6, legislation was recently introduced that more clearly defined and formally recognised the responsibilities for emergency management. New responsibilities were also created through the establishment of new organisations or roles with the responsibility for planning and preparedness. In the UK, an organisation with preparedness responsibilities was *"set up...in response to 9/11"* (Interview UK.62). In Belgium, *"emergency planning is a relatively young service...at the crisis centre...it was only established in 2003"* (Interview Belgium.3), two years after 9/11. A UK interviewee also discussed how *"role[s were] created just after...9/11, to build resilience planning"* (Interview UK.66). Thus, risks becoming a reality in the form of disasters resulted in changing and new emergency management responsibilities.

"[19]95 January 40 people were killed...people really started to reorganise everything and try to re-evaluate every risk ...So the government just reviewed the legal framework and made the policies to make them somehow to be responsible for this" (Interview Iceland.33).

Whilst interviewees in Denmark discussed how *"as a follow up from 9/11 [they] had...an evaluation on how things were going"* (Interview Denmark.22) which resulted in a *"department [that]...was...introduced four years ago"* (Interview Denmark.19), the changes introduced were concerned with crisis management rather than emergency planning and preparedness. At a national level, the topic of emergency planning and preparedness in Denmark was only just being raised. An interviewee outlined how *"the preventive side is coming much more into focus...we are more and more*

seeing a trend towards general prevention in society... We have now seen from the commissioner a communication on prevention...it's about prevention for man-made disasters and natural disasters" (Interview Denmark.21).

For the majority of countries older and/or more recent disasters resulted in changes to emergency management systems and the introduction of new roles and responsibilities. However, due to the differing histories of making changes in response to disasters across the seven countries, there were variations in the levels of maturity of emergency management and preparedness. Some countries, including all of those primarily preparing for natural risks, had a longer history and more experience of improving their emergency planning as they responded to incidents.

In one country, it was the review held by an independent expert following the 2007 summer floods which resulted in recommendations to transfer more responsibility for public preparedness to the public themselves. The recommendations made by the expert resulted in changes in preparedness priorities and responsibilities shifting in new directions.

"[The expert] has come up with sort of...recommendations that the Government have said yeah, we want you to you know, look into these. Now there's lots in there that are around communicating with the public, warning and informing, making the public more resilient you know, taking more responsibility themselves" (Interview UK.62).

"We also have a new programme of work called community resilience, which falling out of the summer floods 2007 and... [the expert's] review into learning lessons and the Government response to [the expert's] review and so on and so forth, we established the programme of work on community resilience." (Interview UK.61).

5.3.2.2 Preparing for man-made risks: crisis versus risk communication

Higher levels of government in four countries (Belgium, Denmark, Sweden and the UK) preferred to prepare their communications ready for when an incident occurred rather than preparing the public in advance. This preference for crisis communication rather than public preparedness and risk communication was based on the type of risk that interviewees were planning and preparing for. This section will illustrate how it was considered more difficult to prepare the public for particular types of risk. It will show how a key finding of this research is that preparing the public for mass evacuation was not considered appropriate for all types of risk due to the uncertainty of response and the perceived low likelihood of needing to mass evacuate. For particular risks, the public mass evacuating during an incident could result in fatalities or injuries to the public.

Interviewees in higher levels of government that were planning and preparing for the man-made threats of terrorism and nuclear accident believed that it was more important to provide the public with information once the incident had occurred rather than before. For them, *“the most important thing...is for [the public] to know how to contact and get information when it happens...[they] don’t give the information to them until it’s really needed”* (Interview Sweden.56).

This desire to focus on crisis communication instead of preparing the public was underpinned by uncertainty and a fear of scaring the public. The *“political...administration...don’t want to talk about risk because [the public] are going to [be] frightened”* (Interview Belgium.1). Interviewees also believed that the uncertainty associated with the man-made risks of terrorism and nuclear accident made it difficult to both plan and prepare the public for mass evacuation.

“The reality is probably what will cause a mass evacuation...will be a threat rather than a hazard, if we’re talking about risks. And those would be sudden impact and the difficulty with coming up with any sort of pre-education strategy is that you scare the living daylights out of people by suddenly talking about bombs and things like that. So the reality is it’s difficult to do pre-education... which is why we rely very heavily on making sure that the communications that are needed in respect of telling the public you know, that a bomb’s just gone off and things like that” (Interview UK.62).

“But in a...city, evacuation could be caused by a number of things; so in order not to confuse people, I would think that... it is more relevant that they are given clear, constructive information in the situation instead of knowing beforehand, because they don’t know which situation is going to occur” (Interview Denmark.19).

Interviewees in higher levels of government preparing for nuclear accident may also have been reluctant to prepare the public to mass evacuate as mass evacuation is only an appropriate and safe response during particular stages of a nuclear accident. Interviewees preparing for a nuclear accident outlined multiple countermeasures that could be taken to respond to a nuclear accident. *“Eat[ing] those [iodine tablets] is one countermeasure. To clean up areas is another countermeasure. To send out information from the radio ‘stay indoors’ that is the best countermeasure...sometimes of course you perhaps end up in the situation that we have to evacuate”* (Interview Sweden.59). *“When there is a problem...either you evacuate...or you...have to stay inside, close the windows, close the doors”* (Interview Belgium.6). For interviewees, the most appropriate response depended on the stage of the nuclear accident. Evacuation was only considered a possible option before a nuclear release. For example, *“the preventative evacuation [is] when there is a risk of radioactive emission within the foreseeable future”* (Interview Belgium.11). There is *“a very acute phase where [they] perhaps evacuate before a release”* (Interview Sweden. 57).

Evacuation during a nuclear release was not considered an option in the majority of countries. Interviewees *“evidently...try to avoid evacuation during the nuclear burst”* (Interview Belgium.41). Even *“in [the] worst case it’s very, very unlikely that any of those amounts of radioactivity would lead to a decision that we are going to evacuate an area”* (Sweden Interview.56). When a nuclear accident happens abroad *“you can’t evacuate...because it’s a very diffuse situation. You don’t know what area you should evacuate and to where because the accident is very far away”* (Interview Sweden.57). Interviewees outlined how *“it’s not the best thing to evacuate...for a nuclear incident the best thing is to stay at home”* (Interview Belgium.1). If interviewees cannot evacuate the public before the release *“it could be better to stay indoors and wait for the release to stop”* Interview Sweden.57). The need for the public to stay indoors was supported by interviewees in a further three countries with nuclear and/or chemical facilities (Denmark, Germany and the UK). Whilst flooding was considered the primary risk in Germany, interviewees also discussed how they *“have in the neighbourhood, three nuclear power plants”* (Interview Germany.30). *“If you have...NRBC [i.e. nuclear, radiological, biological, chemical] situations...it’s much easier to leave them in the homes...ad hoc mass evacuation is not possible; you will kill the people actually”* (Interview Germany.27). *“The majority of guidance...is go in, stay in, tune in...chemical plumes and things like that, they very quickly pass over. So if you went indoors and shut all your windows, probably in about ten minutes it’s almost safe to come out. Whereas if you stood outside and watched it, you’d be ill”* (Interview UK.66). The public are advised to stay inside during nuclear accidents as *“you are much more safe inside a building”* (Interview Denmark.21). Thus, whilst mass evacuation is possible before a nuclear release, it is considered inappropriate during a release as it could result in injuries or fatalities for members of the public. This research found that preparing the public for mass evacuation in the event of a nuclear accident is more difficult due to the uncertainty surrounding whether mass evacuation will actually be the most appropriate response. The need for different responses based on the stage of the nuclear accident has implications on and restricts how EMAs can prepare the public. As EMAs preparing for nuclear accident may not know whether the best response is mass evacuation or sheltering inside until the incident occurs, it may explain why interviewees prefer to focus on crisis communication rather than preparing the public.

Another issue associated with preparing the public to mass evacuate as a result of man-made risks was the distinction interviewees in three countries (Belgium, Sweden and Denmark) made between evacuation and the public leaving an area. Interviewees outlined how *“an evacuation [is] when they’ve time to do it. Otherwise...it’s telling the people that they have...to run away as fast as they can because*

there is danger. That's not an evacuation, that's something else" (Interview Belgium.9). *"There's...a big difference between a prepared evacuation and flight. If it's really needed and everyone has to go then we would say just...go and then you don't need all these arrangements"* (Interview Belgium.5). *"An evacuation is only where people have a necessity for goods from the municipality"* (Interview Denmark.22). In situations where the public have to leave an area due to high levels of contamination after a nuclear release *"[they] don't call it evacuate, [they] call it move"* (Interview Sweden.57).

This distinction between a planned evacuation and the public leaving an area immediately after an incident meant that two national level interviewees preparing for terrorism (Denmark and the UK) believed that a mass evacuation would not occur. One interviewee outlined how they *"wouldn't imagine any large scale evacuation during a terroristic attack. We did not see it in 9/11, we didn't see in Madrid, we didn't see it in London in 7/7"* (Interview Denmark.22).

"My predecessor who did this job...his sort of strapline is well they never evacuated...in the Second World War when there was far more bombing...And actually, if you look at somebody making this decision, it's absolutely career suicide for a minister, it will never, ever happen. But we have a plan should there be questions in Parliament...So politically, yes we have a plan but when it comes to, it will never happen" (Interview UK.65).

This belief that mass evacuation would not occur in response to a terrorist attack may also explain why interviewees preferred not to prepare the public for mass evacuation but preferred to focus on crisis communication in response to an actual incident. As the public were considered less likely to need to evacuate for the man-made threats of nuclear accident and terrorism, interviewees in higher levels of government preferred not to prepare the public to mass evacuate in response to these risks. This research found that the uncertainty of response and perceived low likelihood of needing to mass evacuate for man-made risks resulted in a preference for crisis communication rather than preparing the public to mass evacuate.

The reluctance to prepare the public for man-made risks was also shared by interviewees in the three countries predominantly preparing for natural hazards. Interviewees discussed how they *"have the political hazards...the hazards that nobody wanted to talk about...Nobody wanted to talk about terrorist acts"* (Interview Iceland.32). For interviewees, *"the one big difference...between natural disaster[s] like earthquake and...civil protection activity is that the role of...information dissemination to the public [is] we will be attacked by some country or we have already [been] attacked by terrorists or some countries"* (Interview Japan.34). Whilst the national government of one country organised an exercise

responding to a terrorist attack, interviewees discussed how *“some municipalit[ies]...don’t want to do such kind of exercise...more politically”* (Interview Japan.36).

“Normally...[for] exercises and trainings...we have... a little bit of radioactivity or radioactive agents you know...So, that's normally the scenario, but not the loss of the real containment you know. And, if somebody wants to [exercise] that... that’s political[ly] not possible. Because, there are politicians who will always say nuclear power-plants are a benefit and safe, and if you do such an exercise and you have to evacuate the whole town...nobody will come back home” (Interview Germany.27).

This political resistance to prepare the public for man-made risks is in contrast to the political support evidenced in a country preparing predominantly for natural hazards. An interviewee outlined how *“the last minister we had has been very supportive of our work and very interested in the work that we do so we have been able to do a lot of interesting projects”* (Interview Iceland.31).

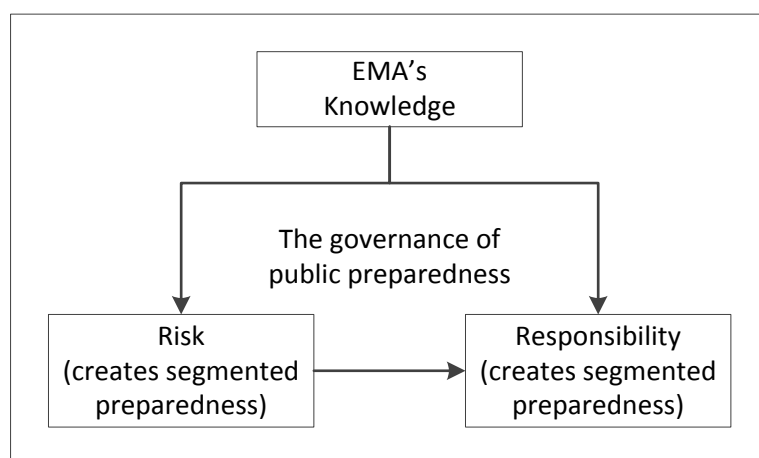
Thus, in all countries man-made risks were viewed as being more politically ungovernable than natural hazards. Interviewees in all seven countries considered it more difficult to prepare their public for mass evacuation in response to the man-made risks of terrorism and nuclear accident. This was due to the uncertainty of response, a perceived low likelihood of mass evacuation occurring and political reasons. The four countries predominantly preparing for man-made risks therefore preferred to focus on communication once the incident occurred. Terrorism was one risk that the majority of interviewees were not preparing their public for and where the responsibility was not being transferred down to local governments.

The above sections have outlined the findings of this research on the key role that risk played in how public preparedness was governed and on its contribution to the segmented preparedness approach identified. It has highlighted how risk resulted in interviewees preparing the public unequally for mass evacuation by determining the groups of the public that interviewees prepared and the types of incident that they prepared the public to respond to. It has also explored the findings on how countries re-evaluated and introduced emergency management systems and responsibilities in response to disasters. As countries have different histories and experiences of disasters, the maturity of emergency management and preparedness varied across the seven countries. The section concluded by examining the findings of this research on how the type of risk determined the appropriateness of whether the public should be prepared for mass evacuation. It illustrated how for man-made risks, there is uncertainty surrounding whether mass evacuation is the appropriate response which could result in fatalities and/or injuries to the public.

5.4 Knowledge, risk and responsibility

This section will outline the findings on the final element of Figure 5.3; EMA's knowledge. It will examine how EMA's knowledge was central in influencing how public preparedness was governed. EMA's knowledge determined the risks that interviewees prepared their public for and explained why preparedness responsibilities were distributed to local governments and particular organisations. In addition to the role of knowledge, this research also identified the implications of a lack of knowledge of a risk and the dangers associated with only preparing particular segments of the public based on expert's knowledge and assessment of risk.

Figure 5.3 The influences on how public preparedness is governed and their relationship



5.4.1 EMA's knowledge of particular types of risk

As outlined above, interviewees working in higher levels of government held different attitudes towards preparing the public for different types of risk. Preparing the public for the man-made threats of terrorism and nuclear accident was considered more difficult partly due to the uncertainty associated with these types of risk. However, the three countries predominantly planning and preparing for natural hazards (Germany, Iceland and Japan) yielded more detailed knowledge about the risk and its behaviour. This knowledge of a particular natural hazard was predominantly gained through the use of technology such as cameras and sensors that were used to monitor the risk and alert organisations to any changes that may cause the need for mass evacuation. For example, an interviewee used *"a webcam"* to *"monitor... this volcano at this moment"* (Interview Iceland.31). *"Instruments [were also placed] inside of the land...[and in the] seabed. The seismologists monitor those instruments"* (Interview Japan.37).

“There is a gauge within water. And also, using this camera, this video, we also check the situation of river. So that...he can check the situation of the river, so when something happens, he should come to this office, so he is continuously checking the situation of the river” (Interview Japan.34).

“The scientists...monitor this area very, very closely and they tell you within an hour if the [volcano] is going to erupt...and they can tell you if there is going to be an earthquake pretty soon by measuring the tensions in the ground. So the area is very densely populated with measuring equipment” (Interview Iceland.43).

Data was also used to model and simulate the predicted behaviour of future incidents. These technologies and models provided interviewees with advanced knowledge of when the disaster was likely to occur, giving both organisations and the public time to put their preparedness plans into practice. For example, *“depend[ing] on what kind of disaster you have. If you have...a storm tide, [interviewees] have normally... up to 9 hours or 10 hours in advance you know, that there will be a storm tide; so you can react, respond” (Interview Germany.26).* In the case of *“the typhoon, [interviewees] are sure at least three days ahead of...time and...keep monitoring their track...[to] update the prediction every hour so [they are] pretty sure how [to] behave in anticipation of the typhoon” (Interview Japan.35).* Thus, rather than being unexpected incidents, interviewees have time to organise their response and the mass evacuation.

The models also provided interviewees with advance knowledge of the areas that would be impacted by the natural hazard. They *“show[ed interviewees]...which districts [would be] affected” (Interview Germany.67)* during an incident and how *“the [particular risk] will affect [an] area” (Interview Japan.38).* One model showed interviewees how a flood during a volcano would affect different areas as time progressed.

“One and a half hours after the eruptions starts, the water is at [a particular] stage. After two hours it has advanced across the road...and after two and a half hours, it’s closing the road junction up here...Based on that information, we looked at the inhabited area and decided on the evacuation priority” (Interview Iceland.32).

Whilst interviewees planning for nuclear accident also discussed the use of technology and models to gain knowledge, this was predominantly for predicting the behaviour of the nuclear cloud after an incident had already occurred. One model discussed was concerned with *“how to predict...where the [nuclear] cloud would go. They would compile the knowledge of the cloud with the climate data, wind data...to know where would this cloud go” (Interview Denmark.22).* An interviewee in another country outlined how *“if [they] know that there is an accident abroad and [they] know the place where it*

happens then the Institute will [use a model to] help us to calculate what path the disperse will take and then [they] can see if it will touch our county or not” (Interview Sweden.57).

Thus, the knowledge that EMA’s could gain of the behaviour of natural hazards in advance of an incident made this type of risk more governable than man-made threats and enabled interviewees to prepare their public to respond to this type of risk. The advanced warning that could be gained for natural hazards would provide EMAs with the time (e.g. 9-10 hours or 3 days) to plan and conduct the evacuation. As outlined above, evacuation would only be a response to a nuclear accident before a nuclear release and interviewees considered an evacuation unlikely for man-made threats.

Whilst interviewees were gaining detailed knowledge of the risks that they were aware of and were focusing their preparedness approaches on this knowledge, there may be additional risks that they were unaware of, as illustrated in the next section.

5.4.1.1 Incorrect risk knowledge

Whilst interviewees gained knowledge and governed their public to prepare for particular risks, this research found an example of where the knowledge EMAs held about the potential risk to a particular group of the public was incorrect. The example highlights the dangers of the segmented preparedness approach implemented to different extents in all seven countries. Experts had informed emergency management staff and the public living in the area that a fireworks factory would not pose any risks in terms of explosions. *“There was a major discussion in the local population...media and...the politician systems. And, everyone was told at that time...nothing would happen ...The authorities...also...made investigations... everything showed that nothing will happen” (Interview Denmark.20). “All the experts said that this would never happen” (Interview Denmark.20).*

Emergency management staff and the public living in the area around the fireworks factory believed that as there was no risk, there was no need to prepare. When the incident did occur and the explosions started, it was unexpected for both parties leading to confusion. The emergency responders and public had relied on the incorrect knowledge of experts, making the evacuation more difficult when the risk was realized. Interviewees outlined how *“the police actually had to argue with some of the inhabitants...[as] they are a little bit confused, because they've been told for years that there were no danger, and suddenly these guys come up and tell them there is a danger ” (Interview Denmark.20). “All knowledge... [had] said well, it would never explode” (Interview Denmark.20).* An interviewee from another country also discussed the incident and how *“the fire brigades, the police and civil protection*

wanted...people to evacuate...but because they had no evacuation procedure...the people there did not know how to evacuate, where to go and so on” (Interview Iceland.32).

When the unexpected incident occurred, the unprepared public found it harder to respond. Until the fireworks factory exploded, it was not known that it posed a risk to the public living in that area. As it was not deemed a risk, responsibility for preparedness had not been transferred to the public. The incident *“gave [the interviewees] a new knowledge”* as *“something...happened that should not happen”* (Interview Denmark.20). The danger of basing preparedness practices on risk assessments that may change as a result of new knowledge was also highlighted by an interviewee from another country. They outlined how *“the hardest thing...after [a] risk assessment was trying to install the same mental structure [in a different] area because people always thought ...[the volcano would] never go that way, it will always go this way”* (Interview Iceland.44). These examples highlight the issues caused by only preparing groups of the public considered at risk. If incidents occur in areas not deemed as at risk, the public may find it more difficult to evacuate as they do not have any knowledge of how to respond. However, as outlined above, mass evacuation is not always the appropriate response to an incident.

5.4.2 Shifting responsibilities to those with knowledge

This research found that EMA’s knowledge was also used as the basis to transfer responsibility to particular levels of government and organisations.

5.4.2.1 Local governments’ knowledge of their public

As outlined above the responsibility for preparing the public was predominantly transferred down to lower levels of government. Interviewees in all countries, except one, viewed lower levels of government and particularly local governments as being better suited to having the responsibility for public preparedness due to their closeness to the public.

In many countries, *“the public make contact with [the] municipality because it’s closest to the public that’s why [national governments] have to cooperate very efficiently with the municipalities”* (Interview Sweden.59). Interviewees discussed how *“the municipalities are the primary structure or administrative body... with almost all tasks regarding the citizens...A lot of the things you need as a citizen...you go to the municipality”* (Interview Denmark.21). *“There’s quite a lot of things [that] they are responsible for and that make[s] them...very skilled to communicate with the public, as people almost on an everyday basis have some sort of contact with the municipality”* (Interview Sweden.56).

Being close to the public was also viewed as providing local governments with knowledge of the public that higher levels would be unable to gain. Interviewees considered *“local knowledge [as] imperative”* (Interview Iceland.32). Through their interaction with the public, *“local authorities...have a lot of [views] from the population, and they know... we have to explain this, this, this and this”* (Interview Belgium.1).

“So probably at a local level, where the boroughs know their static community and they know what the issues are, we can think about warning and informing at a lower level. Whether we can do warning and informing across the whole region in respect of something like mass evacuation, I don’t think that’s being realistic, it just simply isn’t” (Interview UK.62).

Interviewees on a local level supported these views, outlining how they *“know those people...we know where they...live...we are caring about them”* (Interview Germany.14). These interviewees *“live there [with the public, they] know what the perception of people is, [they] know what their concerns are”* (Interview Belgium.4). If there were groups of the public that interviewees did not have knowledge of such as immigrants, they outlined how they could *“turn to interest organisations, for example...an Islamic centre,... a Buddhist centre...and they know very well the people that live in the area, that’s a very good way to get information”* (Interview Sweden.56). Interviewees also discussed *“making a link [with] General Practitioners [/Medics] because they know their people”* (Interview Belgium.6).

Local governments were viewed as the most appropriate level of government to prepare the public due to their closeness and their ability to gain knowledge that would enable them to understand their public and the issues related to public preparedness. Thus, as illustrated by Figure 5.3, knowledge determined the distribution of responsibilities. The responsibility for public preparedness was transferred to those who were considered to have the knowledge of the public whose preparedness they were trying to influence. Being close to the public would enable local governments to observe their public and gain knowledge of their preparedness and how it could be influenced.

However, as highlighted above, segments of the public not considered to be at risk were not prepared for mass evacuation therefore no knowledge was required of these segments. Knowledge of the public was only required by those interviewees with a risk in their area.

5.4.2.2 Shifting organisational responsibilities

In the majority of countries (Belgium, Germany, Iceland, Sweden and the UK), responsibility was also transferred to the individuals or organisations with the knowledge and expertise to undertake preparedness tasks. Knowledge was therefore used as a basis to divide and further distribute

preparedness responsibilities. Interviewees would not always *“do the job [themselves. They would] use people that have the right background, the right skills and the responsibility”* (Interview Sweden.56). For example, an organisation was given *“the responsibility for the development of [a] program. [They] develop this program, but [they are] not working with it... [They] train the people who work with it”* (Interview Germany.15). Interviewees discussed how *“they have very good relations with all these organisations...researchers and science boards. [It] is something that is very important”* (Interview Iceland.31).

One preparedness task that was transferred by many national governments was that of gaining new knowledge. This included knowledge and *“understanding of the hazards...face[d]”* (Interview Iceland.31) and knowledge of *“communication and behaviour”* change (Interview Sweden.59). Responsibility was transferred to universities that were considered to have the knowledge and expertise to perform this task. Interviewees discussed how they *“get...information [about the hazard]...from the research that these people are doing and the research that...masters and PhD students are doing”* (Interview Iceland.40). This *“new information or...new findings...[was considered] immensely valuable”* to interviewees (Interview Iceland.40). National governments also shared the research and outputs generated by universities. A university in one country was writing a *“practical guide”* on emergency planning for the national government to disseminate to lower levels of government (Interview Belgium.7). National governments also *“buy a lot of research...and [disseminate it to lower levels of government by] offer[ing] the more populist versions of the research in small brochures or in handbooks and on [the] website, training, exercises”* (Interview Sweden.58). *“Where [interviewees] know of the research, [they] share it. For example at [a] national workshop [they] had...two presenters from [two universities] presenting...their information to the responders. [They] do promote it as far as possible”* (Interview UK.63).

5.4.3 A lack of knowledge and experience in risk communication

This research found that the maturity of approaches to preparedness varied. Whilst many interviewees had knowledge and experience of communicating with the public during a crisis, communicating with the public in advance of an incident was a new area that had only recently been introduced by the majority of national governments preparing for nuclear accident and terrorism (Belgium, Sweden and the UK). As outlined above, for Denmark, emergency planning and preparedness was only just emerging as an area of discussion at the national level.

Interviewees outlined how *“another unit, about risk...working with risk communication in advance...[had] just started up”* (Interview Sweden.58). One national government *“doesn’t [give a lot of guidance on preparing the public] at the moment, but...have two strands of work which will expand on this”* (Interview UK.61). These strands of work will address *“how [they] can...better prepare the public and make them understand the risks that they potentially face”* (Interview UK.61).

“I think it’s because a few years ago, the political administration do not want to explain a lot of risk. They thought that it’s going to be dangerous, it’s going to be a panic, great panic for the population. But now, since, I don’t know, five years, ten years, we are going to work about crisis communications. It’s new. Crisis communication [is] a new concept” (Interview Belgium.1).

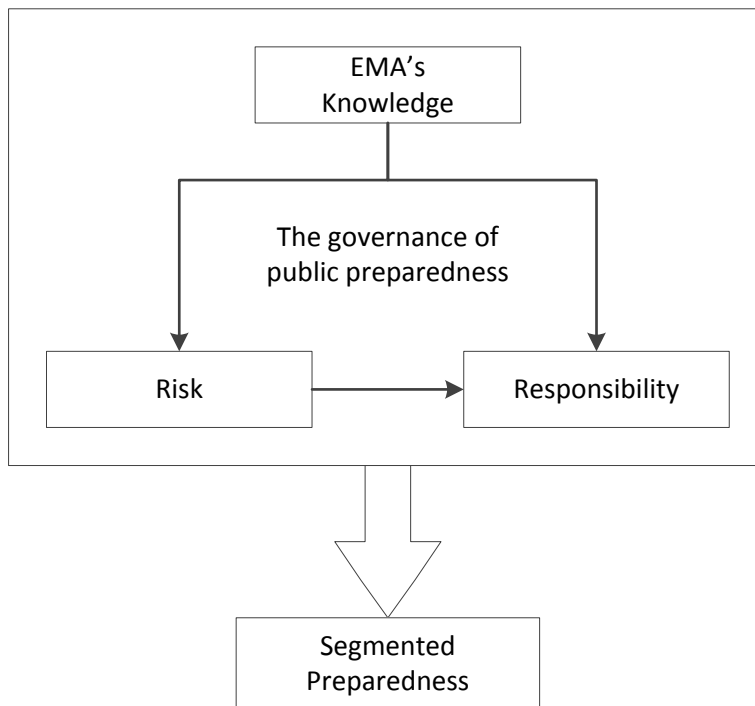
Interviewees in these countries had gained knowledge and experience of crisis communication; however risk communication was a new area for them. This may explain why the national government interviewees preparing for nuclear accident and terrorism preferred to focus on crisis communication, an area they had knowledge of and were familiar with. As their knowledge of risk communication and preparedness advances, interviewees may shift from a focus on crisis communication towards public preparedness.

5.5 Conclusion

This chapter outlined the findings on how public preparedness is governed. As Figure 5.4 illustrates, it has shown how responsibility, risk and EMA’s knowledge influenced how public preparedness was governed and how these influences contributed to the segmented preparedness approach used by interviewees.

In order to provide contextual information, the chapter first addressed the second research question covering how EMAs distribute the responsibility for public preparedness at an institutional level. Supporting the literature examined in Chapter 3, the findings show that preparedness is governed at multiple levels, there is a multiplicity of actors involved, and a shift of responsibility away from the state. However, a key finding of this research is how the ways in which the responsibilities for public preparedness were distributed between the different levels of government and organisations meant that interviewees did not prepare all members of the public equally for mass evacuation. Public preparedness is segmented, with particular levels of government and organisations having responsibilities to prepare particular groups of the public living in particular areas for mass evacuation as a result of particular risks. This resulted in an inconsistent approach to preparedness and a perception that segments of the public had different levels of preparedness for particular risks.

Figure 5.4 The influences on how public preparedness is governed and their relationship



The findings outlined in this chapter also addressed the first research question on how EMAs influence the public to prepare for mass evacuation. Focusing on the findings related to the institutional governance of preparedness, the findings of this research show how risk and EMA's knowledge were both central in determining interviewees approaches to public preparedness.

Risk acted as a boundary determining which members of the public interviewees prepared for mass evacuation. It was living within an area considered at risk of a hazard or threat occurring that determined whether the public were influenced to prepare for mass evacuation. However, the findings also highlighted a number of issues associated with influencing the public to prepare for man-made risks. Interviewees considered it more difficult to prepare the public for mass evacuation as a result of man-made risks due to the uncertainty of response, perceptions of a low likelihood of the need for mass evacuation and political reasons.

This research also found that EMA's knowledge had a critical role in determining the particular types of risk that the public were prepared for and the allocation of preparedness responsibilities. Interviewees preparing for natural hazards had more advanced and detailed knowledge of the risk and its behaviour. As interviewees held less knowledge on man-made risks, it was more difficult to prepare the public for this type of risk.

This chapter has highlighted how in the majority of countries, segmenting preparedness based on factors concerned with risk and EMA's knowledge created a perception that segments of the public had different levels of preparedness to respond to particular risks. The next chapter will explore the different practices that are used by governments and organisations to prepare the public for mass evacuation and transfer the responsibility for preparedness to the public themselves. It will further examine how the use of different types of preparedness practices may create segments of the public with different levels and types of preparedness for mass evacuation.

Chapter 6. Risk Based Segmenting Preparedness Practices: Exclusionary, Informing, Involving and Influencing

6.1 Introduction

The previous chapter outlined the findings on the influence that responsibility, risk and EMA's knowledge had on how public preparedness was governed. This chapter examines the four dominant practices that were used by interviewees. Whilst the majority of practices were designed to increase the public's readiness to mass evacuate, the data analysis process outlined in Chapter 4 highlighted how not all practices focused on preparing the public. Figure 6.1 provides an overview of the four practices, the countries using each practice and the level at which the practices were used within each country. As Figure 6.1 shows, within each country multiple practices were used and in some cases individual interviewees were also using more than one practice.

The chapter will show how through their use of the four practices, interviewees did not prepare the public equally for mass evacuation but focused predominantly on preparing the public living within the geographic boundary of risk and particular groups within this boundary. It will also highlight how the four practices that were used across the seven countries were related to risk and how each practice varied in the extent to which the responsibility for preparedness was transferred to the public, if at all. The findings outlined in this chapter are based on the researcher abstracting from the data and not on testing a pre-conceived model. In brief, the chapter will examine;

- **Exclusionary Practices** – interviewees in all countries did not prepare segments of the public living outside the geographic boundary of risk. As these segments were not considered at risk no-one had responsibility to prepare them to mass evacuate. [section 6.2]
- **Informing Practices** – in all countries, communications materials were used to provide the public in at risk areas with information in advance to make them knowledgeable about how to respond when an incident occurs. The information disseminated to the public varied based on the type of risk that a country was preparing for. Interviewee's implementation of informing practices were influenced by both risk and legislation. Different approaches were used to inform different groups of the public within the risk area potentially resulting in different levels of public preparedness. [section 6.3]
- **Involving Practices** – the public in at risk areas were invited to participate in interviewee's preparedness activities to gain experience of how to respond when an incident occurs. Interviewees included particular groups in these activities however there were some groups

that were viewed as being unable to participate. The participation was concerned with interviewees and the public working together and sharing the responsibility for preparing for mass evacuation. [section 6.4]

- **Influencing Practices** – interviewees wanted to influence the public to undertake preparedness behaviours so that they would be able to help themselves when an incident occurred. As the one country that had embedded this practice had a high level of risk, they tried to influence a larger proportion of the public to undertake preparedness behaviours. [section 6.5]

Figure 6.1 The four preparedness practices identified

	Exclusionary Practices		Informing Practices		Involving Practices		Influencing practices	
Characteristics	<ul style="list-style-type: none"> – Groups outside the geographic boundary of risk and those at risk of particular threats are not targeted – Level of risk determines usage – Absence of responsibility 		<ul style="list-style-type: none"> – Communications to provide knowledge of how to respond – Type of risk determines the information provided – Focus on particular risks, particular areas, school children and farmers – Foreigners are excluded or indirectly targeted – Public given responsibility for informing themselves and vulnerable groups 		<ul style="list-style-type: none"> – Participation to provide experience – Focus on particular risks, particular areas, school children and farmers – Elderly and disabled and foreigners are excluded – Shared responsibility with particular groups of the public 		<ul style="list-style-type: none"> – Focus on preparedness behaviours – Influencing a larger proportion of the public to prepare – Responsibility is transferred to the public so that they help themselves when an incident occurs 	
Usage	Implicit	Explicit	Localised	Widespread	Localised	Widespread	Localised	Widespread
Country								
Belgium								
Denmark								
Germany								
Iceland								
Japan								
Sweden								
UK								

Geographic Boundary of Risk

Transfer of responsibility

The sections below will examine each practice and how they differ in terms of;

- The level(s) of government and organisations using the practice
- Their desired goals
- The groups of the public that were (not) targeted
- The transfer of responsibility for preparedness.

6.2 Exclusionary Practices

This section will examine how interviewees typically did not target groups of the public living outside the geographic boundary of risk or did not prepare the public for particular risks. It will show how a country's level of risk influenced the extent to which exclusionary practices were (not) used. It will also discuss how, for segments of the public not identified as being at risk geographically, no one had responsibility for their preparedness.

6.2.1 The limitations of national preparedness approaches

A handful of interviewees working at the national government level in two countries (Belgium and the UK) discussed preparedness approaches targeting their entire population. However, interviewees in one country believed that this approach was too generic and was considered as junk mail by the public. The approach consisted of a booklet that was *"issued by [national] Government... quite some time ago"* (Interview UK.62). The booklet distributed to every household in 2004 provided the public with *"general advice about what to do in emergencies"* (Interview UK.63). However, two interviewees commented how *"if I was a normal member of the public I'd view that as junk mail"* (Interview UK.65). *"A lot of people would treat that as junk mail. That's the difficulty...with this sort of thing...it's kind of trying to cover absolutely everything that could happen in a very generic way"* (Interview UK.62). Both interviewees questioned *"how many people have still got their copy...at home?"* (Interview UK.62). A national government interviewee from another country also questioned the effectiveness of generic approaches to preparedness outlining how *"it's difficult to send out...preparations to people [for] all types of risks. You would have to do it on demand"* (Interview Sweden.58).

Whilst the booklet was viewed as junk mail, a national government interviewee from another country discussed how they were behind in preparing *"a new information campaign, [for] all the country and especially around nuclear site[s]. This is...special information for nuclear"* (Interview Belgium.1). For the interviewee *"it's a very difficult campaign. We are a little bit too late. It's a European obligation."*

We have to do [the campaign]. There are problem[s] with the management...We are too late [by] two years" (Interview Belgium.1). Although the findings highlight two approaches targeting entire populations, one approach was a single booklet disseminated in 2004 that interviewees believed the majority of the public had thrown away and the other approach was a future campaign focusing solely on nuclear risk which was an overdue European obligation.

6.2.2 Not preparing the public equally

As illustrated in Figure 6.1, interviewees working in different levels of government in five countries (Belgium, Denmark, Germany, Sweden and the UK) did not prepare (i.e. excluded) segments of the public living outside the geographic boundary of risk or did not prepare the public for particular risks. Whilst interviewees discussed how they prepared the public in particular areas, *"it is not in the area where you are safe"* (Interview Germany.27). *"There are campaigns for the people who are living around [the different risks but] not for the whole of Belgium"* (Interview Belgium.13). Interviewees *"don't think [a preparedness leaflet] is sent out to everyone"* (Interview Sweden.56). *"The municipalities...give these leaflets to the people [in the area] there because people have to be aware...[in other areas] they don't need that"* (Interview Belgium.5). In one country, interviewees' plans also excluded the public living outside the geographic boundary of risk. Interviewees outlined how they *"don't have to plan outside this area but inside we had to make a plan but not outside"* (Interview Sweden.59). *"Outside that zone [they] have to improvise"* (Interview Sweden.57). Thus, in this country, both plans and preparedness approaches did not cover entire populations. Interviewees were not preparing all members of their public equally but were excluding groups of the public living outside of the areas considered at risk. *"Generally people around the nuclear power plants... are very involved in the evacuation and...the next challenge will be the ones living outside the zones and how to inform them and why they are not being taken care of. The ones in the [risk] zone they are very [involved]"* (Interview Sweden.59). The public living outside the geographic boundary of risk may be excluded from preparedness approaches if there is no plan to mass evacuate. An interviewee outlined how *"if the administrative authority has no process to make the evacuation...how can [the public]...know if there is nothing to know"* (Interview Belgium.10).

Although the public living outside the areas considered at risk were excluded in these countries, an interviewee commented how *"you don't have to give this message only to the people who live in the area of the [risk]. You have to...be prepared [for] the evacuations. Not only for those people who live in [the risk] area, but all the people who live in...Belgium"* (Interview Belgium.8).

In the two countries planning for terrorism (Denmark and the UK), the entire population was not viewed as needing to be prepared as *“the people who are living in [a particular geographic area at risk of terrorism] don't have to know necessarily”* (Interview Denmark.23). Preparing the public in a particular area considered at risk of terrorism was viewed as more difficult as they *“don't have [risks] in the way that [other parts of] the country would. So for us...pre-education has been a lot harder”*. For this interviewee, *“when you can target certain areas with known hazards, it's a lot easier”* (Interview UK.62). Interviewees in both countries discussed how government prepared the public living in areas considered at risk of flooding or chemical accident, however, interviewees did not prepare the public living in the areas considered at risk of terrorism. Thus, interviewees were not only excluding segments of the public living outside of the risk zone but also the public facing the particular risk of terrorism.

Whilst the use of exclusionary practices was explicitly discussed by interviewees in the five countries, this particular practice was actually used by all seven countries. As interviewees in the five countries clearly discussed how they did not prepare the public living in particular geographic areas or did not prepare the public for particular risks, this was categorised as an explicit use of exclusionary practices, as highlighted in Figure 6.1. By only preparing segments of the public living in particular areas considered at risk and preparing the public for particular risks, as evidenced in the previous chapter, all countries were using exclusionary practices. As interviewees in two countries (Iceland and Japan) did not explicitly discuss not preparing the public in particular areas or not preparing for particular risks, this was categorised as an implicit use. However, as the next section will illustrate, the use of exclusionary practices was determined by a country's level of risk.

6.2.3 The use of exclusionary practices and levels of risk

Although interviewees in Iceland and Japan targeted segments of the public considered at risk, they did not explicitly discuss implementing exclusionary practices. However, as shown below interviewees in these two countries discussed higher levels of risk for a variety of natural hazards.

Interviewees in Iceland discussed how the country *“is like a small laboratory of hazards”* (Interview Iceland.31). It *“stands out for having so much glacial cover; 11% of the country is ice covered. [It has] some of the most active volcanoes...and eruptions...lead to flooding... We can have viscous eruptions anywhere”* (Interview Iceland.44). There is also *“an earthquake zone that goes through the middle of Iceland”* (Interview Iceland.31). It is *“a country where you have volcanic eruptions, you have earthquakes”* (Interview Iceland.32). In addition to the earthquakes and *“volcanoes around Iceland...there are [also] a lot of large glacier rivers all around Iceland”* (Interview Iceland.45).

“It’s a small nation and it’s a large country and we have many hazards, so it’s one of the highest frequencies in the world of natural phenomena. In volcanic activity usually we say we have every three to fifth year we have a volcanic eruption and we have strong motion earthquakes and avalanches, both regular avalanches and snow avalanches and we have these glacier bursts or these volcanic eruptions underneath the glaciers... we have at least two big glaciers that have volcanic activity underneath and then we have two others that might have it...So we have all these violent storms during the winter and we have flood surges and floods from rivers” (Interview Iceland.31).

In Japan, interviewees discussed how they are *“one extreme...because, [their] country has so many disasters”* (Interview Japan.35). Interviewees outlined how *“one target of the mass evacuation is large scale earthquake”* (Interview Japan.34) and how they *“will have...several earthquakes within thirty years”* (Interview Japan.38). The country *“is going to have a very huge earthquake in [the] very near future. Between 2020 and 2040 [they] probably are going to have a series of earthquakes which amounts to a magnitude 8.7”* (Interview Japan.35). *“The possibility of the Tokyo metropolitan area [being] hit by...the earthquake is almost 70% within [the] next thirty years”* (Interview Japan.39). In addition to *“earthquake planning, [interviewees also planned and prepared for]...meteorological disaster, flooding...typhoon...[and] landslide”* (Interview Japan.34). *“Weather is a national concern so [interviewees had] weather information on a regular basis”* (Interview Japan.35). This country also has a *“very clear tsunami threat so that evacuation from tsunami attack...is getting very popular”* (Interview Japan.35).

Interviewees in these two countries discussing higher levels of risk for a variety of natural hazards across their countries did not explicitly discuss implementing exclusionary practices. Thus, as highlighted in Figure 6.1, the level of risk across these two countries influenced their preparedness strategy. The countries having large areas that were considered at risk of multiple hazards resulted in interviewees targeting a larger proportion of the population with their preparedness approach. As outlined in the previous chapter, these higher risk countries were also the only countries with actual experience of mass evacuation.

In contrast, interviewees in the four countries preparing for the man-made threat of terrorism or nuclear accident (Belgium, Denmark, Sweden and the UK) discussed implementing exclusionary practices and lower levels of risk in their country. Interviewees discussed how the public *“are extremely calm”* (Interview Sweden.58) as they are a *“small peaceful country”* (Interview Sweden.59). In these countries, they *“have very rare real crisis situations...[they] don’t really have a risk culture or a sensitivity that there is a risk”* (Interview Belgium.9). Interviewees discussed how whilst there may be small scale evacuations in their country or in particular areas *“the risk or the probability of having a very*

large scale evacuation organised by the authorities is relatively low” (Interview Denmark.23). These countries “*don’t have an all-consuming single evacuation risk like they do in [other countries]*” (Interview UK.61). Interviewees outlined how “*if you’ve got something that regularly happens you can really make it relevant... We just don’t get that kind of stuff*” (Interview UK.62). They “*don’t...want to give out...information...because that is kind of scaring people towards a situation that is not going to happen*” (Interview Denmark.23).

“I think there was no necessity [to prepare the public]. We are not living in a country who had a lot of water, who has mountains, who has earthquakes...this is a real quiet country....When there was really the need to do such things, they would do it. But there was no need yet. In [other specific countries] it’s another thing. They have a lot of flood” (Interview Belgium.8).

Thus, geographical risk mediated the extent to which exclusionary and therefore inclusionary practices were used by countries. Geographical risk acted as a filter determining which areas of a country were (not) targeted with interviewees’ preparedness approaches. Countries with higher levels of risk did not use exclusionary practices to the same extent as those with lower levels of risk.

6.2.4 Exclusionary practices and transferring responsibility

Interviewees in five of the seven countries (Belgium, Germany, Iceland, Japan and the UK) discussed how they wanted their public to take some responsibility for their own preparedness. They outlined how “*people will have the responsibility*” for preparing (Interview Japan.36). For interviewees, responsibility was concerned with “*self-protection*” (Interview Germany.30). “*Self-reliance...it is really important that...the authorities, stress that point.... [They]...tell the people, be aware of the danger and please do something about it... [They] try to explain how important it is that people also take their own responsibilities*” (Interview Belgium.5). In two countries (Belgium and the UK), the desire for the public to take responsibility was more recent. Interviewees discussed how “*there is a piece of work around getting people to think about being more resilient in themselves, so that if you do have to evacuate, you need to think about taking medication...that’s very much...around...personal resilience*” (Interview UK.62).

“Our messages, you are the first protector [of] your security. You have to do that... to protect your family...Because in ’99, 1980, all of the authorities say to the public don’t worry be happy, the authorities do all of the things. It’s not true. And now we are saying, okay you are the first actor of your security. It’s then if you want to be a good man, you have to protect yourself, protect your family, to act correctly and so on” (Interview Belgium.1)

In four of these countries, three of which were preparing for natural hazards, interviewees not only wanted the public to take responsibility for their own preparedness but to also share the responsibility

for both the preparedness and response of vulnerable individuals. Interviewees outlined how they told the public that they *“can’t think only of yourself you must think of others and that seems to work”* (Interview Iceland.40). Both preparedness communications and warning messages advised the public to *“think about old persons, ill persons, and...to think about persons who can’t hear”* (Interview Germany.69). Preparedness materials also communicated to the public how *“at the time of the evacuation... you should take care about those who need assistance, like the elderly or the kids”* (Interview Japan.34). The national government of one country *“have also started to look at how we can encourage better community resilience – being better prepared in general and looking after your neighbours and being able to identify how to help each other in times of emergency”* (Interview UK.63).

“Well we expressed the community spirit of things because we cannot be everywhere and do everything. You have [to] look after your neighbour. So if you know that when you are...a farmer in this area and you are evacuating, you know that on the next farm there is an old women maybe and you know that she’s probably alone because everyone is out at work. Your responsibility is to help her” (Interview Iceland.40).

Whilst interviewees in the majority of countries wanted the public to take more responsibility for their preparedness and the preparedness of vulnerable individuals, no one had responsibility for preparing the segments of the public that were identified as not needing to be prepared. Governments only prepared and therefore transferred responsibility to segments of the public considered at geographic risk for particular hazards. Thus, governments were not transferring the responsibility for preparedness equally to all members of the public. As shown by the fireworks factory incident discussed in the previous chapter, not preparing particular groups can make these groups more vulnerable to the risk as they are confused when there is the need to evacuate. However, for interviewees, there is also the issue that mass evacuation may be an inappropriate response to particular incidents.

The sections below will examine how even within the geographic boundary of risk, there are groups of the public that were to some extent excluded from particular preparedness practices.

6.3 Informing practices

This section will outline how informing practices are concerned with the use of communications material to provide the public with knowledge of how to respond so that they can be prepared for when an incident occurs. The section will highlight how the information on how to respond varied based on the risk that a country was preparing for. It will show how informing practices were used in different ways to inform particular groups of the public and discuss how this could potentially result in

different levels of public preparedness within a risk area. It will also examine interviewee's desire for the public to take responsibility for being informed.

6.3.1 Informing to provide knowledge

As illustrated in Figure 6.1, the use of informing practices were widespread as many interviewees across all seven countries and working in different levels of government and organisations discussed the use of informing practices to prepare the public. Informing practices were most similar to risk communication as outlined in chapter 2, due to the focus on communicating preparedness information to increase the public's knowledge.

Interviewees outlined how they were *"responsible... [for] informing the public by different means"* (Interview Germany.28). These means were predominantly communications channels that were used to *"give [the public] information, lots of information"* (Interview Germany.14). Interviewees in all countries used communications material including websites and *"leaflet[s to]... give information to the people"* (Interview Belgium.5). They *"have sent out information [to the public], they've sent pamphlets"* (Interview Sweden.60). In one country, an organisation in a particular area *"distributes...information to all the residents once a month"* (Interview Japan.34). Interviewees *"try to inform the public as much as [they] can. [They] have on [their] website...information...[and] try to update it regularly"* (Interview Iceland.40). Interviewees discussed the high importance that they placed on providing information to the public and how they *"have to have information to the public"* (Interview Iceland.31). *"The most important thing is information. Inform the people, communicate"* (Interview Belgium.5). Informing the public was viewed as important as *"a well-informed public will respond more calmly than one that isn't well-informed"* (Interview UK.62).

For interviewees, informing practices were concerned with providing the public with knowledge in advance that prepared them to respond to an incident. Interviewees outlined how *"you need pre-information so that people know"* (Interview Germany.27). *"It's about information making people aware"* (Interview Belgium.5) *"so that the public knows how to behave"* (Interview Germany.28). Interviewees believed that if the public weren't knowledgeable, they may not understand the warning or that it may result in panic. *"The recipient of...warning[s] should be in a sense educated...because [if they] don't have any framework to understand, the warning may be just a noise"* (Interview Japan.35). *"If people don't know, they will fall down the stairs just in panic to get away; so [interviewees] have to inform them...But [they] find that, if people know about things, it is much easier"* (Interview Denmark.16).

This research found that the type of risk determined the information that was provided to the public. As outlined in the previous chapter, higher levels of government preparing for man-made risks preferred to focus on crisis communication due to the higher levels of uncertainty. As the desired response to an incident could be either evacuation or sheltering indoors, the majority of countries (Belgium, Denmark, Germany, Sweden and the UK) informed the public that when an incident occurs they will hear a siren and should access further information on what to do. Interviewees outlined how they *“inform the persons in advance so that they know what to do if they hear the siren”* (Interview Germany.28). They provided the public with information on *“what should they do to have further information and that’s the radio”* (Interview Sweden.57). The public are told that *“if you hear a siren...you turn on your radio”* (Interview Germany.27). An interviewee outlined how *“there is a brochure that is already distributed with some guidelines...the population should be asked to listen...to radio or to... the television to know more in detail what to do and...where to go”* (Interview Belgium.71). Thus, due to the uncertainty surrounding what the desired response to a future incident should be, interviewees in the majority of countries prepared the public by informing them of how they would receive information on how to respond once the incident had occurred and the uncertainty was reduced.

The four countries preparing for man-made threats informed the public in advance that once the siren is activated they should go inside and listen to the radio or television for information on what to do. *“When [the public] hear that siren [they] must stay inside...listen to the radio”* (Interview Belgium.13). *“The homepage where [the public] can get information [informs them] that when they hear the sirens...they [should] go inside, and [turn on] their radios”* (Interview Denmark.23). National level interviewees in two countries (Belgium and the UK) discussed the issue of preparing the public for mass evacuation when the public have been informed that they should shelter inside and listen to the radio. *“One of the reasons why...it’s difficult to send any information about evacuation, [is] if for months you say to your population, stay at home, close your doors, close your windows. You can’t come and send them leaflets...to prepare for evacuations”* (Interview Belgium.1). For these countries, *“mass evacuation goes against...[the] emergency planning principles... of...stay [in] and tune in”* (Interview UK.65). Although an option, mass evacuation is considered unlikely in these countries. Therefore, due to the type of risk that these countries are predominantly preparing for, preparedness information predominantly advises the public to shelter inside and access further information in response to an incident.

Interviewees in three countries (Belgium, Denmark and Germany) also discussed issues associated with the use of sirens. They outlined how *“the sirens is...a means to call attentions to the population, and different siren calls means different things [however]...people are not aware of the meaning of the sirens anymore”* (Interview Denmark.20). Interviewees *“don’t think that the public knows how to react in a really good way...When you’re 200 metres away from these sirens nobody understands. So that’s one of [their] problems”* (Interview Belgium.9). An interviewee living in an area considered at risk was unaware of how they should respond to a siren. They outlined how they *“live...not very far away from a nuclear site...there are sirens which are tested once every month...Apart from that I still don’t hear from anybody...if these sirens...go, what is to be done? What do I do, run or stay inside, close doors and windows?”* (Interview Belgium.12). An interviewee in one country believed that immigrants would either not understand what the sirens mean or the instructions on how to respond. They outlined how *“even if [immigrants] know that the siren...is the signal you have to switch on your radio, they will not understand what the radio speaker wants to say...We guess that no Turkish speaking radio will give the information”* (Interview Germany.27). This interviewee also outlined how a lack of knowledge concerning what the sirens meant during a flood in the 1960s resulted in fatalities.

“When the sirens were started [the public] thought about the gas plant...and they thought there will be a huge fire. But, the sirens mean the dykes are broken actually. And so, they were lying in bed and were drowned in the bed. And so, 372 people were killed...because they did not know what [the sirens] means” (Interview Germany.27).

Thus, if the public do not know what the sirens mean and how to respond to them, they may respond incorrectly to an incident and risk their safety. If interviewees prefer to focus on crisis communication, it is important that the public are prepared by knowing what the sirens mean in advance of an incident. However, even if the public know what the sirens mean, interviewees in two countries also discussed how, due to double or triple glazing, the public may not be able to hear them. *“The problem is today sirens are not a real help...Today, we have [windows with] three glass plates...But, [they are]...sound repressing, so even if you have a siren right across the road, nobody will realize that the siren is running”* (Interview Germany.27). *“When you have double glazing or triple glazing, you have insulation then you don’t hear the sound from outside anymore, so that isn’t very efficient”* (Interview Belgium.4). Being unable to hear the sirens may also prevent the public from responding as desired by EMAs.

Informing the public that they should access further information in response to a siren was not discussed by interviewees in the two higher risk countries (Iceland and Japan) predominantly preparing for natural hazards. In both countries, interviewees discussed how the public should evacuate in

response to a siren/alarm. In one of the countries, *“for the tsunamis...[siren] alert, they are going to be [told] that tsunami is here and evacuate immediately”* (Interview Japan.50).

“Part of the evacuation plan was to inform the inhabitants where they are supposed to go...in information that has been distributed...in the area, they are told, depending on where they are if the alarm sounds. You can see it in the leaflets...they have arrows if you are in this particular place you have to go to this place” (Interview Iceland.46).

As both countries are predominantly preparing for natural hazards and have previous experience of mass evacuation, and therefore have less uncertainty, interviewees were able to provide specific information that the response to a siren is evacuation. As also shown below, interviewees in the three countries preparing for natural hazards also provided the public with more detailed information on the risk.

6.3.1.1 Measuring changes in awareness and knowledge

Whilst the majority of countries (Belgium, Denmark, Germany, Iceland, Sweden and the UK) investigated whether the public had received or accessed the preparedness communications materials used to provide information, only three countries (Denmark, Iceland and Sweden) investigated whether the communications material had achieved its goal and increased public knowledge.

To check that the public had received communications material, *“the personnel in [a particular area] went from door to door and asked the people if they got this [flooding leaflet] and, to prove if [it] is [the] map [for the particular area] and not the other one”* (Interview Germany.25). An interviewee discussed how a nuclear company that sends a newsletter to the public living around the nuclear plant *“has a pretty good idea about [it’s] effectiveness...because one of the things they do is they put...in [that] you can win a prize, so then you can measure the response rate and see how many people read this”* (Interview Belgium.4). Interviewees also outlined how they monitor the number of visitors to their websites that includes preparedness information. *“During [an] earthquake...a few thousand...visited the website...on a normal day-to-day basis the number of hits are very low”* (Interview Denmark.21).

Whilst the majority of countries investigated public awareness of the communications material, identifying members of the public who had received or visited communications materials would not indicate whether the public had been informed and were more knowledgeable of the desired response. Identifying whether their preparedness approaches had resulted in a change of knowledge was only undertaken by three countries (Denmark, Iceland and Sweden). Interviewees *“have done investigations where [they] have asked people, “Do you know where you have your leaflet...?”And if you ask one year*

after the distribution most do know where they have the leaflet and know the content in it. If you ask after four years perhaps 40% [know] that" (Interview Sweden.57). *"One...or two years ago...they have questioned a lot of people do [you] know what [the sirens] means. And, not so many actually do"* (Interview Denmark.23). Interviewees in one country discussed how they had *"done some research [to investigate] if the tourist know about this and [they] did it before [they] put up the signs and [they are] coming back this year to see if there is a change"* (Interview Iceland.40). Thus, whilst all countries are using communications material to inform and increase their public's preparedness knowledge, only three countries investigated whether they are achieving this goal. As there are different ways in which the public could respond to an incident, and an incorrect response could result in injuries or fatalities, it is important for EMAs to know whether the public are knowledgeable of the desired response and that they address low levels of knowledge.

6.3.2 Informing different groups

This section will examine how informing practices focused predominantly on groups of the public within the geographic boundary of risk. It will also show how within this geographic boundary, different groups of the public were informed in different ways which could potentially result in varying levels of public preparedness within an area. As illustrated by Figure 6.1, there were groups of the public within the geographic boundary of risk that were to some extent also excluded.

6.3.2.1 Informing the public in at risk areas

As outlined above, the public in geographic areas not identified as being at risk were not selected to be prepared for mass evacuation. This theme was supported by the findings on the use of informing practices and how interviewees in all countries *"try to inform the people that are living...in the dangerous [i.e. risk] areas"* (Interview Germany.26). *"In the area where [they] have flood danger, [interviewees] try to reach people...inform them"* (Interview Germany.27). Interviewees believed that the public living in the particular areas where *"the risk is higher...should be...more informed"* (Interview Belgium.12). They outlined how *"people who live in a risk area...will get information"* (Interview Belgium.5). *"Some of the [areas], where they have got very obvious...risks...do a lot of work around warning and informing"* (Interview UK.62). The public *"live together [in the risk area] and...are always informed"* (Interview Denmark.23). Interviewees discussed how members of the public living in the risk area are regularly targeted with informing practices. *"Information [is] handed out...in the inner zone...where they have [the risk], they do that quite frequently...at least once every year"* (Interview

Sweden.56). The public living in the areas considered at risk *“get informed in their mailboxes on a regular basis...and they know they are in that area and the process is much better documented”* (Interview Belgium.2).

Whilst interviewees in Iceland and Japan also discussed how *“they need[ed] to make some information [and]...distribute [it] to the whole household...in these [risk] areas”* (Interview Japan.50), informing the public living in the geographic boundary of risk was not discussed to the same extent as in the other five countries. As outlined above, these countries have higher levels of risk and therefore may be informing the majority of their population.

The type of risk also determined the amount of detailed risk information that was provided to the public. Countries predominantly preparing for natural hazards (Germany, Iceland and Japan) were able to use the knowledge that they had gained about the risk and its behaviour to produce and send hazard maps to the public in the at risk areas. As the maps included detailed information and diagrams illustrating how an area was at risk of being affected by the particular natural hazard, different maps were produced for different areas. In the three countries, there are *“endangered areas...and for each region [they] have a special...folder [i.e. leaflet]...so if you live in [a particular endangered area] you get this... and there you can read where can I...go to”* Interview Germany.26). In addition to including risk information, interviewees in two countries also discussed how the maps included the location of the shelters/rescue accommodation. *“All the maps show the shelters, the evacuation space, or the space you can get some support”* (Interview Japan.39). On *“these leaflets...you can see the rescue accommodations”* (Interview Germany.25). Whilst interviewees in the other country preparing for natural hazards did not discuss including shelter information on the maps, they discussed how *“most of the shelters that have been appointed in advance, they have markings...on the outside of the buildings”* (Interview Iceland.42). Thus, the type of risk determined how informing practices were used with the countries preparing for natural hazards providing the public with more detailed information on both the risk and where to go once an incident occurred.

The type of risk also determined whether services were available to provide the public with risk information. Services providing the public with information on natural hazards were available in three countries (Belgium, Iceland and Japan). Interviewees discussed websites where the public could gather risk information on one particular natural hazard. *“For example, ...[there is] a website and...you can put in the area where you live and then you can search for the risks of flooding. Are there floods or not in the coming days”* (Interview Belgium.5). *“It’s all on the web actually. Everybody...can monitor*

volcanoes if they want to... There are people...who always check every day so they know" (Interview Iceland.44). Interviewees in one country *"have established a very good, very advanced text message system...citizens...who [have] registered to this text message service, can get the information of the water height level of each river, and also ...the meteorological warning"* (Interview Japan.34). These services developed for natural hazards would provide the public with advanced knowledge of a potential incident and therefore time to plan and prepare their response. However, it can be argued that services such as these may prevent the public from preparing as if no risk is identified, the public may believe that there is no need to prepare.

The previous chapter outlined how legislation was used to transfer the responsibility for preparing the public. Legislation also influenced the practices that were used as governments and organisations were legally obligated to use informing practices to prepare their public. Interviewees in three countries preparing for man-made threats (Belgium, Denmark and the UK) discussed this legal obligation to provide the public with information on at least one risk and safety measures. This requirement to use informing practices was *"something new in [the] legislation. There is a [law] of...2006 and a new mission for the public authority is to inform...the population. It's something new"* (Interview Belgium.10). An Act introduced in one country in 2004 made *"communicating with the public...law...There are...duties [to] inform the public of the risk in their area"* (Interview UK.63). Whilst this requirement to use informing practices to prepare the public was recent, no interviewees discussed legislation requiring them to use involving or influencing practices to prepare their public for mass evacuation.

Legislation at both a national and international level required informing practices in particular to be used to prepare the public for particular man-made risks. *"It's a legal obligation in Europe for people who are under the influence of chemical risk and nuclear risk to get information about the risk that they are having"* (Interview Belgium.9). Organisations in one country *"develop websites [and] leaflet campaigns [as there are]... statutory defined duties around nuclear and COMAH sites to provide information"* to the public (Interview UK.63).

"If you are a high-risk facility by law you are obliged to have a contingency plan... And, the other thing is to inform the public... living there... you have to tell them about what kind of factory is it, what type of chemical hazards...is...it. How to get away, where do I have to go; and something about first-aid" (Interview Denmark.20).

As the majority of countries had chemical and nuclear facilities, they would legally be required to use informing practices to prepare the public. All countries may be using informing practices to prepare

their public, as illustrated in Figure 6.1, as that is what they are legally obliged to do. However as examined in the next section, not all groups of the public within the geographic boundary of risk were informed in the same way.

6.3.2.2 Informing particular groups in the at risk areas

This section will discuss how interviewees informed particular groups of the public within the geographic boundary of risk. As outlined in Figure 6.1, it will show how informing practices were used in different ways to inform different groups of the public.

6.3.2.2.1 Informing foreigners

Interviewees in four countries (Belgium, Germany, Sweden and the UK) discussed the difficulties associated with informing foreigners. Because of the multiple languages used, interviewees in the majority of countries prepared foreigners differently to native language speakers within the geographic boundary of risk. As evidenced below, foreigners were either excluded or informed indirectly potentially resulting in these groups of the public being unprepared to mass evacuate.

Interviewees discussed how it is “*difficult*” to inform the public in particular areas “*because of the number of different nationalities and different languages*” (Interview UK.66). “*It’s not so easy to catch up with...40 different languages*” (Interview Sweden.60). In two countries “*there [are many] nationalities...and normally the young people speak the [national] language but...the parents... still speak their [own language] - and that’s a problem*” (Interview Belgium.13). For interviewees that “*have this mixture [of] immigration background, it’s a real problem to do this risk communication to the people*” (Interview Germany.27). “*Written...communication...is a problem because...there [is] something like 36 main languages...in [one area]*” (Interview UK.64). In addition to immigrants, informing tourists was also considered an issue as they “*may not be English language speakers [and] ... obviously don’t know the area*” (Interview UK.65). One country has “*some tourists... [speaking] about 80 [different] languages...[and outlined how] it is a problem to speak [to] them*” (Interview Sweden.59).

For one country, informing foreign language speakers was particularly difficult as “*everybody is expected to speak Dutch...[they]... are not allowed to communicate in another language*” (Interview Belgium.8). An interviewee questioned how “*people who don’t speak Dutch, how would they know?...How would they know when you...only communicate by written things [in Dutch]?*” (Interview Belgium.8). Therefore, in this country not only were segments of the public living outside the

geographic boundary of risk excluded but also segments of the public within the risk area unable to understand the preparedness information written in Dutch.

Whilst interviewees in the remaining six countries provided information in multiple languages, the majority of countries disseminated this information indirectly to foreigners, relying on them searching for the information themselves. For example, interviewees in two countries disseminated leaflets to the public that were predominantly written in the national language, however included one sentence outlining how the information could be requested in foreign languages. One leaflet outlined how *“Information on Preparedness...is available...from the municipality”. And it says the same thing in all the different languages so, basically, it tells you to contact the...municipality for further information in your own language*” (Interview Sweden.56). Although natives in these two countries received information in their own language, this approach required foreigners to read the leaflet written in a language they may not understand to find one sentence in their language informing them how to access preparedness information that they are able to understand. Thus, segments of the public may have been excluded from this informing practice if they could not understand the leaflets written in the native language and if they were unaware that the information was also available in their own language.

In another country leaflets were originally printed in five languages however interviewees had *“information...that...[nobody] wanted to have the leaflet in another language. So [they] decided just to put it on [the] homepage so that people that are interested in it, can look into the internet and see for information in their own language*” (Interview Germany.28). A further two countries also informed foreigners using *“website[s]... [including]...information in other languages...English...Arabic, Somali, Turkish...[They] had some advice on what are the languages... most commonly spoken*” (Interview Denmark.21).

“We even put on our website...information for Polish people. We have a lot of people from Poland working in construction and other areas so we said that they have to get some information. So we put a section on our website in that language. So we try to improve if we see that there is something lacking” (Interview Iceland.40).

Disseminating preparedness information to non-native language speakers solely over the internet or requiring them to contact their local government for information in their own language relies on these groups knowing that the information is available, knowing how to access the information, and having the resources to be able to do so (e.g. access to the internet). Thus, within the geographical areas considered at risk, there may be groups of the public that are to some extent excluded and that are at

higher risk as they have been targeted indirectly with informing practices. Whilst natives living within the geographic boundary of risk received information directly through their mailbox in their own language, non-native language speakers had to seek out information in their own language. A native interviewee of one country discussed the problems that they had experienced in trying to find preparedness information in foreign languages on the internet highlighting the difficulties foreigners may experience in trying to access preparedness information.

“I know they have these leaflets in different languages but today I...I tried to... get one ...for you and it was not possible on the internet. Maybe I’m just silly to use it but I didn’t find an English one or a Turkish one, which is very important because we have... 200,000 Turks here” (Interview Germany.70).

As foreigners were prepared differently to natives, different segments of the public within the geographic boundary of risk may have different levels of preparedness.

An alternative approach to informing foreigners that did not exclude them to the same extent was adopted by a local government in one country. In addition to information being available in foreign languages on the internet and in tourist agencies, hazard maps delivered to the public living in risk areas also included the most important information in *“Japanese, English and Spanish”* (Interview Japan.50). By providing the important information in three languages, less segments of the public were excluded from understanding the preparedness information.

6.3.2.2.2 Informing school children

Interviewees in the majority of countries targeted school children with preparedness practices. In four countries (Iceland, Japan, Sweden and the UK), interviewees discussed how they specifically provided school children with preparedness information and knowledge. In one country (Japan), the use of informing practices to prepare school children was widespread. Interviewees discussed how school children in this country *“typically at the fourth grade of primary school, learn [about] their community. As a part of their learning, they will learn the past major disasters which hit their region so that they could know what... happened”* (Interview Japan.35). Interviewees across this country *“think that the education in elementary school is very important...and fire fighter[s] visit elementary school and make lectures to the school kids. [They] think that it is very important to...understand the importance of disaster preparation from [a] young age”* (Interview Japan.34).

However, in the other three countries, interviewees discussed how local governments and organisations informed school children within a particular risk area suggesting a more localised use of

informing practices. An organisation discussed how they *“visited all the schools in the earthquake zone and we [provided] information”* (Interview Iceland.42). Interviewees *“are going to the schools within a distance of about 30kms [within] this zone and...are talking with the pupils there and...are talking with the teachers”* (Interview Sweden.59). *“They visit [these] schools and inform pupils and teachers”* (Interview Sweden.57). As outlined above, interviewees were indirectly informing foreigners. However, for interviewees in two countries, school children were viewed as a tool for spreading preparedness information further and were seen as particularly valuable for communicating preparedness information within immigrant families where some members may not speak the national language. Targeting school children *“is really interesting as the children take the message home and they talk about it amongst the family and often in homes if [the national language] isn’t the first language it’s a very good way of getting that information back”* (Interview UK.68).

“If you want some information out...go into the school cos kids speak [the national language] and their own language. And then they go back because the old people don’t speak [the national language] when they emigrate here and that’s really what’s the best. They have done tests and so on and have found out that’s really the key to get into different foreigners. To get the information through” (Interview Sweden.60).

Whilst these three countries did not inform school children across the whole country, interviewees believed that *“the schools thing has huge potential...if you reach that section of the population, you reach all the grandparents”* (Interview UK.68).

6.3.2.2.3 Informing farmers

In three countries (Belgium, Iceland and Sweden), interviewees provided information to farmers due to the impact that an incident would have and the need for farmers to take particular measures.

Interviewees *“distribute[d] brochures to farmers so they know what to do”* (Interview Sweden.59).

Information was also provided *“during an information session for the farmers round [the risk area]”* (Interview Belgium.1).

“We have met all the farmers in the whole county because the farmers will probably have problems...because the agriculture is very sensitive... you must have restrictions in the consumption, like...milk ... everything, so we have met every farmer with some exceptions of course. There are perhaps about 1000 farmers” (Interview Sweden.57).

“We...told...the farmers they have to leave their animals inside because there is a lot of lightning. If you let your animal out it’s going to be frightened. But then you’ve got another [concern] also, you have to let your animals out because if you keep them inside they will drown. So we just have to say to the farmers there is a risk of electrocution and there is a risk of

drowning...We just tell them it's no way that you can take the animals with you because if there was about 15,000 cows or something" (Interview Iceland.40).

These findings highlight how interviewees were not preparing all groups of the public equally. Whilst foreigners within the geographic boundary of risk were not targeted directly, interviewees were targeting farmers with tailored preparedness information. Using informing practices in different ways to target different groups of the public may result in segments of the public with different levels of preparedness.

6.3.3 Informing practices and transferring responsibility

As outlined above, interviewees in five of the seven countries wanted the public to take responsibility for preparing themselves. A handful of interviewees across four countries (Germany, Iceland, Japan and the UK) discussed wanting the public to take responsibility for informing themselves and/or vulnerable groups. They outlined how *"we have to take care from both sides, they have to care for themselves, they have to inform themselves, so get some material"* (Interview Germany.14). Interviewees distributed communications material to *"explain...about what the public should care, and the first is...that you should get the information, you should [view] the information by yourself"* (Interview Japan.34). Interviewees wanted the public to inform themselves so that they *"know the plan...know what can happen"* (Interview Iceland.40).

In addition to informing themselves, interviewees in two countries (Germany and the UK) also *"want[ed] people to inform their neighbours...elder people, and disabled people"* (Interview Germany.14). Communications material advised the public to think about *"persons maybe from abroad that are not able to speak, to understand [the national language]"* (Interview Germany.69). Guidance created by the National Government of one country encouraged local governments to share the responsibility for informing vulnerable people with the general public:

"It may be that the most effective communications route is a single leaflet expressed in very simple language (or more than one language) backed up with pictures and symbols, which includes a request that the reader should share the information with family, friends, and neighbours who are not able to read the information themselves" (Country UK, Cabinet Office, 2010, p.99).

These two countries may have shared the responsibility for informing vulnerable people with the general public as both countries were not directly informing vulnerable people. As outlined above, interviewees in these countries discussed the difficulties of informing foreigners and used an indirect approach requiring foreigners to search for preparedness information in their own language. Whilst

interviewees created lists of elderly and disabled individuals who may need support during an evacuation they did not discuss preparedness communications materials that were tailored to the needs of elderly or disabled people (e.g. leaflets in large print or braille). One interviewee outlined how *“there’s nothing for elderly people...[the leaflet] is very technical, it’s very small, even I have problems with my glasses reading it and I can’t imagine how older people react”* (Interview Germany.70). The two countries may have been unable to directly provide tailored information to vulnerable groups such as foreigners and elderly and disabled people as interviewees in both countries discussed the high costs of preparing the public. Thus, rather than incurring the additional costs of directly providing tailored information to vulnerable people, interviewees requested that the wider public help them to share the information with vulnerable groups who may be unable to access or read the generic information themselves. An interviewee outlined how requesting that the general public share the information *“is very important...because...[they] can reach some more persons than the persons who are reading...[the information]”* (Interview Germany.28).

A minority of interviewees wanted the public to take responsibility for informing themselves and/or vulnerable groups of the correct response ready for when an incident occurs. Transferring the responsibility for informing themselves and/or others would not require the public to act on the information and knowledge gained until there was a need for mass evacuation. However, as outlined below, all of these countries transferring the responsibility for informing were using additional practices to prepare their public.

6.3.4 Informing not being enough to prepare the public

Whilst all countries used informing practices to prepare their public, a handful of interviewees across three countries (Belgium, Germany and Sweden) discussed how providing the public with information alone was not enough to prepare them for mass evacuation. These interviewees working at a regional or local level discussed how they *“think...[it is]... best is to look at people, the personal contact when you want to educate people”* (Interview Sweden.60). They believed that having personal contact with the public was more effective than just providing them with information using communications material. For them *“it’s very important to...try to have contact with the public in a first-hand way”* (Interview Sweden.57). Interviewees viewed *“advertisement and leaflets [as having] 50% efficiency [and]...schools and other certain groups... 100% efficiency because we have the personal contact, but... we can’t have this 100% contact with all the area all the time so we have to complement with the less efficient pamphlets and newspapers”* (Interview Sweden.57). An interviewee discussed future plans *“to go*

directly to the people, not thinking about well will they read [the leaflet], will they see it; but we have to confront them...we think it is a good idea, possibility to get in contact with the people, just waiting [until] they get our information, wasn't successful" (Interview Germany.28).

"I don't think it's enough that someone gives you a magazine and asks you to distribute it. That's not enough, its information but it's not enough...When you participate in exercises that is better. Informing the public is not the same as preparing the public, a magazine or brochure is not enough" (Interview Belgium.4).

The next section will examine how interviewees in these countries were not only informing their public but were also involving them in institutional preparedness efforts.

6.4 Involving practices

This section will examine how involving practices are concerned with public participation and the public gaining experience of how to respond when an incident occurs. It shows how involving practices did not focus on all members of the public equally, but focused on particular risks, the public living within the geographic boundary of risk, and particular groups living within this boundary. It will also outline how involving practices are concerned with shared responsibility and interviewee's desire for the public to cooperate with interviewees in order to prepare together for mass evacuation.

6.4.1 Involving the public in planning and preparedness activities

Interviewees in five countries (Belgium, Germany, Iceland, Japan and Sweden) discussed how they had moved beyond solely informing their public and were also using involving practices to prepare their public. As involving practices were discussed by a minority of interviewees in four countries, their use was categorised as localised in Figure 6.1. In the one country (Japan) where involving practices were discussed by the majority of interviewees, the usage was categorised as widespread. In all five countries, it was predominantly local governments and organisations that used involving practices suggesting that this was a practice that they predominantly had responsibility for.

Involving practices were characterised by public participation in planning and preparedness activities. Interviewees in the two higher risk countries (Iceland and Japan), discussed how they involve the public and use their input in the planning for mass evacuation. They discussed how they *"built...this evacuation plan mostly on the people"* (Interview Iceland.40). *"At [the] time that they devis[ed]... this plan...[an organisation] make[s] a questionnaire survey to the public...and [the] result of the*

questionnaire survey also reflect into this plan. [It] really used the input from the citizen" (Interview Japan.34).

"We are aware what has the best results...and that is involving those who live with the condition and those who have to evacuate when the distress calls come and they have to know. It's not enough to make an evacuation plan that the people don't know anything about or are not satisfied with. If they are not satisfied, they will not act upon it" (Interview Iceland.32).

Interviewees discussed how they "try to activate [the public's] interest by involving people" (Interview Iceland.32). In the majority of countries (Belgium, Iceland, Japan and Sweden), this involvement was in the form of public participation in exercises. Interviewees outlined how they "involve the public when [they] have exercises" (Interview Sweden.57). "They...advertise...for people to take part in the evacuation exercise and there's quite a lot of interest" (Interview Sweden.59). Interviewees had "small meetings" where they told the public that they "will have an exercise and [that they] need [the public] to participate in it" (Interview Iceland.40). "Exercises [were] based on [the] response to [an] emergency situation" (Interview Japan.36). In one country, they "have the trainings...involving local citizens...three times" a year (Interview Japan.37), whilst in another country "every year [they] have an evacuation exercise" (Interview Sweden.59).

Interviewees discussed the benefits of the public being involved and participating in their exercises. After holding an exercise, an interviewee designed "a survey....The [findings] were all positive...people [could] see how valuable this is. In the survey they also mentioned that they want to continue in that direction, they want to participate" (Interview Belgium.4). Whilst only one interviewee discussed formally evaluating the exercise, interviewees had anecdotal evidence of their effectiveness. They outlined how "the [public] have taken part in the exercise and see how it works...everyone was involved...[and] went away from the exercise very confident because [of] the response" (Interview Iceland.40). Participating in interviewees exercises "make[s] the people feel safer because they know there's a plan" (Interview Iceland.43).

"We got a lot of positive feedback...and I think a lot of it is hugely because people were so much involved in the beginning. Because the process was a really open process and we were always giving information what we were going to do and how we were going to do it. We had a lot of meetings, I don't know how many meetings we had in preparation. It was a lot of meetings" (Interview Iceland.40).

Exercises also provided an opportunity "where people could live the experience, how [interviewees] are going to contact them...and they were much calmer after" (Interview Iceland.43). For interviewees, exercises were viewed as "the best way to learn people what to do when you are evacuated...It make[s]

it easier” (Interview Sweden.59). They *“familiarize...people...with the disaster and behaviour to cope with that”* (Interview Japan.35). Thus, whilst informing practices provided the public with knowledge of how to respond, involving practices provided the public with experience of how to respond. However, as examined above, evacuation is not always the correct response and in certain situations could result in fatalities or injuries to the public.

In two countries (Germany and Japan), it was interviewees working in universities that involved the public by holding *“interactive learning groups”* focusing on particular risks (Interview Germany.29). Although small groups of the public participated in the interactive learning groups, they highlight how interviewees in both countries enabled the public to experience particular natural hazards. A university *“invited the people to...sessions...we had this Flood Box in which we could simulate how a living room was flooded...we had some Flood Cylinders so that the people can walk around and see how they’d feel when you have...this water level around you, surrounded...people would really touch it”* (Interview Germany.29). Again, these interviewees were involving the public in order to provide them with experience of what it may feel like when there is a flood. Similar to this, a university in the other country used computer software during workshops to show the *“residents...the present situation and what will happen at the time of earthquake”* (Interview Japan.38). Although the workshop was primarily concerned with physical planning and reconstructing buildings to make them safer *“after... the physical plan, [participants] are starting to think...we should also make a contingency plan or emergency response plan”* (Interview Japan.38).

6.4.2 Involving different groups

This section will examine how interviewees involved particular groups of the public within the geographic boundary of risk. It will also show how interviewees viewed particular groups as being unable to participate in involving practices.

6.4.2.1 Involving the public in at risk areas

Similar to the practices examined above, interviewees in the five countries using involving practices did not prepare the public equally but discussed involving the public in particular areas and preparing them for particular risks. They outlined how they *“have to focus on this problem [area] and they also have a lot of exercises including people living here”* (Interview Sweden.59). The public living in a particular risk area *“were used to exercises because they had exercised...before”* (Interview Iceland.40). The

interactive workshops held in one country were also for the *“people who...know that [their] community is not safe”* (Interview Japan.38).

The exercises and workshops that interviewees invited the public to participate in also focused on preparing the public for particular risks. The workshops held by universities focused on *“flood-risk management”* (Interview Germany.29) and *“fire spread”* caused by an earthquake (Interview Japan.38). Despite informing the public that they should stay inside and listen to the radio in response to a nuclear accident, interviewees in one country held a *“nuclear exercise...[with] a group of inhabitants from the surrounding areas [of] the Nuclear Power Plants”* (Interview Sweden.59). As the correct response to a nuclear accident varies depending on the stage of the incident, it is important that the public are both knowledgeable that they need to access further information on what to do and that they are prepared to evacuate if necessary.

Interviewees in one of the higher risk countries (Japan) discussed holding exercises for multiple risks and having structures in place to involve the public. National government interviewees in this country discussed *“the exercise [that they] did last year...there was a bombing...many people died or were injured from that bombing attack by the terrorists”* (Interview Japan.36). This country also had *“the tsunami evacuation drills for the local people. At [the] drills, they recognize again that they are living in the tsunami risk areas...they need to evacuate from the red hatched areas [and] at the same time, they need to confirm which [are] the tsunami evacuation buildings”* (Interview Japan.50). Although interviewees in this country held exercises in particular geographic areas and for particular risks, they involved the public in a lot of areas in their activities as they had higher levels of risk. Interviewees outlined how there is an *“organisation called the Voluntary Disaster Mitigation Management Organisation within each community...and, using such kind...of community organisation, the citizens will join...exercise[s]”* (Interview Japan.36). As *“71.7% of [the] neighbourhood community [joins the] Voluntary Disaster Management Organisation”*, this country had structures in place to involve the public in their preparedness activities (Interview Japan.36). The use of these community groups to involve the public may explain why the use of involving practices was only widespread in this country. However, this organisation also focused on particular risks as *“they are very collaborative about the fire and the earthquake, but not for the civil protection”* (Interview Japan.36).

6.4.2.2 Involving school children

Interviewees across four countries (Belgium, Iceland, Japan and Sweden) discussed holding exercises involving school children that predominantly focused on particular risks and/or involved the public in

particular geographic areas. In two countries, exercises involving school children were discussed by individual interviewees suggesting that this was a localised practice. Within the risk area they *“evacuate the 5th and 6th classes in the schools every year...after some years [they] have evacuated everybody... So after some years most people [in the risk area] have taken part in an exercise”* (Interview Sweden.59). Similar to the use of informing practices, involving school children in exercises was also seen as valuable in terms of reaching their family members as *“people in the schools will [go] to their parents after the exercise and tell them about it. They are very enthusiastic. It’s like waves on the sea”* (Interview Sweden.59).

“There are special plans for kindergartens...they have evacuation drills every week there...This is specific drills for evacuating [from the particular risk]. They have that in the schools and the kindergarten in that area. It’s included in our evacuation plan so the kids know where to go and what to do and the parents know that this is in our plan and something we prepare for” (Interview Iceland.18).

For the other two countries, involving school children in exercises was more widespread as it was discussed by multiple interviewees from different areas. An interviewee discussed *“an exercise, it was [on the] nuclear plans and the exercise was limited to a couple of schools to have an idea of how...to evacuate schoolchildren to safe places”* (Interview Belgium.2). In another area of this country, they *“locally...evacuate every school in our village every year at least once as an exercise. The kindergartens, primary schools...again that is local...my little patch”* (Belgium.12). In one of the higher risk countries, *“school communities; elementary schools, junior high and high... are [one of] the fundamental communities to collaborate in case of emergency...they ask the schools to participate at those drills”* (Interview Japan.50). *“Schools and kindergartens tend to have evacuation drill[s] at least once a year, and in some places [a] couple of times a year anticipating big earthquake or fire when their students are at school”* (Interview Japan.35).

“So that ever since the kindergarten, students learn this kind of thing. That is a typical drill at school, it's earthquake drill. When an earthquake occurs, the students go under the table. That position to protect their heads from the falling down stuff...So, that kind of a practice are then incorporated as a part of education program. So, they are asked by I think some kind of regulation that they have to do it at least a couple of times a year” (Interview Japan.35).

6.4.2.3 Involving farmers

The involvement of farmers in exercises were discussed by individual interviewees in three countries (Belgium, Iceland and Sweden). An organisation *“organis[ed] exercises and every time they try to integrate different kinds of population...So one year it was for schools, one year it was the farmers”* (Interview Belgium.17). An evacuation exercise was held in one country involving *“about 16,000 or*

17,000” members of the public (Interview Iceland.40). During this exercise and in the areas evacuation plans, farmers had a special role as a “*follower*” where their “*job is to be the last one to leave...When [they] leave then [they] look...and see if [other people] have [evacuated]. If not, they’re not supposed to evacuate... they are...supposed to...see if the signs are up*” showing that other people have evacuated (Interview Iceland.40). In this area, farmers had a key role and were involved in planning, preparing and responding to an incident. Rather than holding exercises to prepare farmers, an interviewee in one country held an exercise to improve the information that they will provide if a nuclear accident occurs highlighting this country’s focus on crisis communication. During the exercise “*farmers...were listening and...were part of the evaluation; how they responded to the information. What is the right information, what is confusing information...So that of course is [a] very important part of the exercise to hear what the public are saying [about]...how we inform them*” (Interview Sweden.59).

6.4.2.4 Involving elderly and disabled individuals

Although interviewees in four countries involved the public in their exercises, only a handful of interviewees in two countries (Belgium and Japan) discussed involving elderly and disabled individuals in exercises. Whilst in one country, elderly and disabled people participated in an exercise, interviewees in the other country were concerned about elderly people participating in exercises and being able to respond to an incident.

Interviewees outlined how they “*are not used to evacuating disabled [people]*” however included five or six disabled people during a flooding exercise (Interview Belgium.6). During this exercise, they also “*had arrangements for elder people. We had...a quiet room, places where they could relax or they could rest*” (Interview Belgium.5). An interviewee in the higher risk country also discussed how elderly people were considered during exercises. “*They think about how they [can] safely [move] the senior people from this area to outside of this area*” (Interview Japan.36). Whilst elderly people were considered during exercises, interviewees highlighted barriers to including their actual participation in exercises;

“The big reason, it doesn’t move smoothly is that they have lots of elderly people. Those elderly people communities or those elderly societies...they could not establish the systems...Thirty years ago...they established the evacuation plan for the...earthquake...people were young, they have the very active evacuation trainings; they have the stopwatch and when earthquake occur, they move up to the mountains. But these days, it doesn’t work” (Interview Japan.37).

Interviewees also believed that elderly people would be unable to respond when an incident occurred. They outlined how “*previously...in the vulnerable area, we had many young people so they can respond*

to...a disaster...but now-a-days, all the community members becomes elderly and they cannot respond to the disaster, so it is a very big problem” (Interview Japan.38).

6.4.3 Involving practices and transferring responsibility

Interviewees using involving practices were starting to transfer the responsibility for preparedness to the public themselves. For interviewees, it is about *“stimulat[ing] people to get people to exercise together with us. The people together with government...it’s always a partnership between the two. It’s not the people or the government. It’s the people with the government” (Interview Belgium.5).*

Involving practices were characterised by interviewee’s desire for both EMAs and the public to share the responsibility for public preparedness. Interviewees wanted to work in partnership and cooperate with the public in order to prepare for mass evacuation. For interviewees using involving practices, *“it’s always a partnership or a co-operation between the people and the government. Always you have to work together in the case of evacuations” (Interview Belgium.5).* They *“need...people’s cooperation”* and *“expect people to join and co-operate in [exercises]” (Interview Japan.36).* Interviewees did not have sole responsibility for the public’s preparedness but were requesting that the public take some responsibility for their own preparedness. They *“asked people...to please help us. Please participate in this exercise” (Interview Belgium.4).* There were *“joint exercise[s] with the emergency people and the people in the area” (Interview Iceland.45).*

“We [told] them, we are making this plan. This could happen, not likely but it could happen and if it could...then you want to have some plan. And we called [them] to a meeting...They were all willing to help us. They were all willing to be a part of it. On the first day...we had a big meeting...They were very excited...It was good, it was very effective” (Interview Iceland.40).

Whilst these countries were starting to share the responsibility for public preparedness with the public themselves, they were only sharing it with particular groups of the public including school children and farmers. As shown above, only a handful of interviewees discussed involving elderly and disabled people in their exercises and half of these spoke of the problems of including these groups. No interviewees discussed involving foreigners. Thus, the responsibility for preparedness is not shared equally across all groups of the public. As outlined above, interviewees were sharing the responsibility for the preparedness and response of vulnerable groups with the general public. Interviewees may not be involving vulnerable groups as they have retained some of the responsibility for their preparedness through the creation of lists and have also shared responsibility for both their preparedness and response with the general public.

“The citizens have the responsibility for mutual help at the time of disaster...the community members should support sheltering or the evacuation of persons with special needs such as elderly people like, some handicapped. And, this kind of information is disseminated at the time of exercise or during a disaster response in the neighbourhood community” (Interview Japan.34).

6.5 Influencing practices

This section will outline how interviewees using influencing practices were concerned with the preparedness behaviours that the public could undertake in advance of an incident. It will examine how influencing practices predominantly focused on influencing the public to undertake preparedness behaviours to prepare for natural hazards. It will also show how in the one country that had embedded the use of influencing practices, the public’s preparedness responsibilities were formally outlined in legislation. These responsibilities were concerned with the public undertaking preparedness behaviours in advance so that they could help themselves when an incident occurred.

6.5.1 Preparedness behaviours

Interviewees in three countries (Belgium, Japan and the UK) discussed using practices to influence the public to undertake behaviours to prepare for mass evacuation. With its focus on influencing preparedness behaviours, influencing practices were most akin to social marketing as outlined in Chapter 2. As Figure 6.1 illustrates, the use of influencing practices was widespread in the high risk country (Japan), as their use was discussed by the majority of interviewees from this country. However, in the two lower risk countries (Belgium and the UK), influencing practices were discussed by a maximum of two interviewees and were localised as they were concerned with preparing the public in one particular geographic area. Also, whilst these two countries were predominantly planning for man-made risks, the use of influencing practices in these countries were primarily concerned with public preparedness for a natural hazard.

Multiple interviewees in one of the lower risk countries discussed how the public in the Netherlands *“should have...an emergency package at home...a bag...full of basic stuff, a bottle of water, some cookies, spare battery for their cell phone, a map” (Interview Belgium.12).* However, only one interviewee discussed influencing the public in their own country to prepare, and this was for flooding, not nuclear accident - the predominant focus of this country’s planning. This interviewee discussed how *“if you think about how to stimulate people to prepare themselves, we have the leaflets, we also have...the website of [a particular area, there] are...things about emergency kits, what they have to put inside and so on” (Interview Belgium.5).* Rather than using communications material to inform the

public, it was *“so that people can know before a flood what do I have to do. What do I have to think about? For example, a flood kit or an emergency kit where they can already put in some things [such as] some warm, waterproof clothes, a battery radio, rubber clothes, boots, first aid kit, family medication”* (Interview Belgium.5). Interviewees in the other lower risk country also discussed the preparedness behaviour of preparing an emergency kit and how in a particular area some work had been undertaken to *“warn people in advance and make them prepare...grab bag[s] and things like that”* (Interview UK.68). The influencing practice used in this country also initially focused on flooding, however was later broadened to cover preparedness for a wider range of hazards.

“[The] work [was] targeted at school children...in [a particular area]...to help children understand how flooding could potentially impact them and what they could do to help themselves...it encouraged...the family to take action and [the particular area] then went on to develop....[a] calendar which went broader than just flooding and actually looked at other hazards, power outage, severe weather events” (Interview UK.63).

Whilst the practice focused predominantly on influencing the behaviours of school children in a particular area of the country, and was only discussed by two interviewees, an interviewee working in national government outlined how influencing the public to prepare in advance of an incident is *“part of where we are going with...community resilience”*. They were *“going to develop a strategy and an action plan which should be published...next year”* (Interview UK.63). Rather than influencing the public to prepare for particular risks, this strategy *“would advocate...that it doesn’t have to be a flood kit [as the public] should be better prepared for any emergency. If you have to get out of your house because of a fire, flooding you still need the same information e.g. insurance documents, medication. You still need to have your minimum supplies”* (UK.63). Thus, whilst countries currently may not be using influencing practices, as disasters occur in the future and new knowledge on a risk is gained, the use of influencing practices may increase.

In the higher risk country (Japan), the use of influencing practices was widespread as interviewees working in different levels of government and preparing the public in different areas discussed influencing practices. This suggests that the use of influencing practices had only been embedded across this one country. Interviewees in this country discussed how they *“are trying to encourage the people or the organisation...to spend more time...at the community level to promote understanding on disaster[s], hazard[s] and...how [the public] could mitigate the damage and...how they should prepare themselves for what [could] happen”* (Interview Japan.35). Interviewees outlined how *“they go to...communities [and]...explain how [the public can] prepare...they’ll give lectures and communicate to the local people”* (Interview Japan.50). *“Almost every municipality or prefecture government have the*

lecture series on disasters so that the various kinds of disaster related information including how to prepare will be disseminated to the local people" (Interview Japan.35). As outlined above, this country had higher levels of risk for a variety of hazards and threats across the country. As the level of risk was higher, interviewees were influencing a larger proportion of the public to prepare. The higher level of risk, in terms of both the higher likelihood of a disaster occurring and the resulting cascading effects (i.e. an earthquake resulting in fires) may also explain why this was the only country to have embedded the use of influencing practices. Although interviewees in this higher risk country discussed preparing for particular hazards and threats, all areas were at risk from at least two hazards and/or threats. For example, many interviewees discussed how an earthquake could also lead to tsunamis or fires, therefore both the interviewees and the public needed to be prepared to respond to multiple risks. Interviewees wanted the public to prepare for different risks by undertaking preparedness behaviours such as *"stor[ing] up to three days water and some food"* (Interview Japan.37). Communications material included *"seven points of action for citizens starting from electrical fitting and then fixing their furniture, and having the three days' water and food, and this is a checklist of what [they] should have"* (Interview Japan.34).

6.5.2 Measuring levels of public preparedness

It was outlined above how the majority of countries informing their public investigated whether the public had accessed communications materials and/or whether it had increased their knowledge. This research found that the only country to have embedded the use of influencing practices was also the only country conducting research to measure levels of public preparedness. Thus, only one country had knowledge of how prepared their public were. However, the level of public preparedness identified varied depending on whether the research was conducted by national or local government. *"National government will ask what kind of preparedness do you do at home? Do you have like flashlights? Do you have the three days water storage? And then, they tend to answer very high for the basic items"* (Interview Japan.35). In comparison, research conducted at a local level identified low levels of public preparedness.

"The main source to know how the public is prepared for the mass evacuation... is the questionnaire survey...And, through this survey, [interviewees] found out that the people really are afraid and people know the risk of the earthquake so that the people have now had the perception of the risk, but people does not prepare for that...90% of people really afraid about the earthquake, but only...30% people prepares their foods and waters" (Interview Japan.34).

An interviewee outlined how *“based on this questionnaire survey, we make brochure [on] what [the public] should do to reduce damage or reduce the impact at the time of the disaster”* (Interview Japan.34). Although this organisation was also informing the public, it was part of a more strategic approach designed to influence public preparedness behaviours. Consistent with a social marketing approach to behaviour change, the interviewee had conducted research in order to identify levels of public preparedness and once these had been identified as low, a strategy was implemented to increase them. As the levels of public preparedness had been measured prior to distributing the brochure, the interviewee would be able to evaluate the effectiveness of the brochure in influencing the public to prepare.

6.5.3 Influencing practices and transferring responsibility

As outlined above and in the last chapter, legislation required governments to inform their public about particular risks in their area. Interviewees in Japan also discussed how legislation in their country documented the preparedness behaviours that the public should undertake. *“In the disaster act plan...they ask those local people to store...water and food for up to three days”* (Interview Japan.37). *“This law had provision about people...people make efforts...for the implementation of the civil protection measures if requested”* (Interview Japan.36). Legislation outlining the public’s requirement to prepare was not discussed by interviewees from any other country.

In addition to documenting the desired preparedness behaviours, national legislation also outlined the public’s preparedness responsibilities. The Disaster Countermeasures Basic Act in Japan outlines the *“responsibilities of residents and others”* and outlines how *“residents of the area under local government are obligated to contribute toward the cause of disaster prevention by taking their own measures to prepare for disaster and by participating in voluntary disaster prevention groups”* (National Land Agency, 1997, p.5). Interviewees from a particular area also discussed how they *“also [have] their own original ordinance [i.e. a law enacted by a municipality] about disaster management, and”* outlined how;

“They also use the...words that...responsibility of the public, citizen. And, within both plan and ordinance saying the same thing, and it says that citizens...have a responsibility to have at least three days' food and water and some special equipment... for toilets...And also, it says that you should prepare...medicine and also you should prepare some special equipment... to bring at the time of disaster...water, food, and...a credit card, some cash, and the contact address. So, you should prepare such kind of things” (Interview Japan.34).

Interviewees explained how the public also had responsibilities to prepare as *“disaster management is not the only work for...government. So, they should [gain]...input from the public”* (Interview Japan.34). *“In... order to cope with the disaster, we need to mix the three different types of help; self-help, mutual help and public help...things like preparing food and water for the first three days...[are]... a part of self-help”* (Interview Japan.35). Interviewees wanted the public to take responsibility for their preparedness in order to be able to *“survive by themselves [and] that is described in the emergency act plan”* (Interview Japan.37). *“The citizens [also] have the responsibility for...help[ing] at the time of disaster”* (Interview Japan.34). For interviewees in this country, the public needed to support themselves and help when an incident occurred as responder’s *“capability is very limited, so most of the times the fire fighters or the rescue people will not come”* (Interview Japan.50). As capacity is limited, interviewees tell the people to *“do it [i.e. respond] by yourselves or use neighbourhood communities to rescue the people”* (Interview Japan.50). In one of the lower risk countries, the influencing practice being implemented in a particular area *“tried to put in very simple terms what people could do, what risks were out there and what people could do to help themselves”* (Interview UK.63). Thus, whilst informing practices were concerned with knowledge and involving practices with participation and experience, influencing practices were concerned with influencing the public to undertake preparedness behaviours in advance of an incident so that they would be able to help themselves when the incident occurs.

6.6 Conclusion

This chapter outlined the findings on the practices used by interviewees to influence their public to prepare for mass evacuation.

The findings addressed the first research question covering how and why EMAs influence the public to prepare for mass evacuation. Whilst four dominant practices were identified (exclusionary, informing, involving and influencing), not all of these practices focused on influencing the public to prepare for mass evacuation. This research found that the public living outside the geographic boundary of risk were not influenced to prepare for mass evacuation. As each country had different levels of risk, the extent to which the public were prepared or excluded varied across the seven countries. Interviewees also did not prepare the public for particular risks.

Supporting the literature outlined in Chapter 2, the predominant practice used to influence the public to prepare for mass evacuation was informing (i.e. risk communication). Interviewees used this practice to provide the public with knowledge of how to respond to an incident. However, the practice

was used in different ways by countries preparing for different types of risk. Countries preparing for natural hazards provided their public with more detailed risk information and provided services for the public to gather information. Due to the uncertainty of the desired response (i.e. mass evacuation or sheltering inside), interviewees preparing for man-made threats informed their public to access further information on what to do once an incident had occurred. However, a number of issues with this type of approach were identified.

Chapter 2 highlighted how the literature recommends that more than one-way communication is used to influence the public to prepare. Interviewees addressed this recommendation through the use of involving practices that were concerned with participation and providing the public with experience of how to respond. However, the use of this practice was only widespread in one country. This higher risk country was also the only country with a widespread use of influencing practices. With a focus on influencing the public to undertake preparedness behaviours such as creating an emergency kit, influencing practices were most akin to social marketing, as outlined in Chapter 2. Interviewees used influencing practices so that the public would be able to help themselves when an incident occurred. However, influencing practices were used predominantly to prepare the public for mass evacuation as a result of natural hazards.

The importance of using tailored approaches to target different groups of the public was also highlighted in Chapter 2. The findings of this research show how within the risk area, informing and involving practices were used in different ways to prepare different groups of the public. Interviewees focused on school children and farmers due to the benefits of preparing these groups (e.g. spreading information further and protecting livestock). However, as a group considered harder to reach, foreigners were informed indirectly whilst the elderly and disabled were predominantly not targeted with preparedness practices. Using the four practices to prepare particular groups of the public may result in different levels of public preparedness and create groups within the area at risk that are unprepared and therefore are at even higher risk.

Countries were also found to differ in their use of the four practices. Whilst excluding and informing practices were used to different extents by all countries, involving and influencing practices were predominantly localised, with the exception of the one higher risk country, supporting the findings in the previous chapter on how there is a lack of a consistent preparedness approach across different areas.

The findings also covered the second research question on how EMAs distribute the responsibility for public preparedness as the use of each practice determined the extent to which interviewees distributed the responsibility for public preparedness to the public themselves. No one had responsibility for the preparedness of the excluded groups of the public living outside the area at risk. However, interviewees were using informing, involving and influencing practices to distribute the responsibility for their preparedness to the public themselves. In addition to the responsibility for their own preparedness, interviewees were also distributing the responsibility for the preparedness of vulnerable groups to the general public. This may be as interviewees were not directly preparing vulnerable groups and as vulnerable groups may find it harder to inform themselves, share responsibility for preparing with interviewees (involving practices) or help themselves when an incident occurs (influencing practices).

The findings outlined in this chapter will also be used in the next chapter to discuss the third and fourth research questions covering the application of social marketing to influence the public to prepare for mass evacuation. The findings show how through their use of influencing practices focusing on behaviour change, only one country was widely applying social marketing to influence their public's preparedness. The next chapter will use the findings from this chapter to discuss the benefits, barriers and risk factors for EMAs who utilise social marketing to influence their public's evacuation preparedness behaviours.

Chapter 7. Discussion

7.1 Introduction

This chapter relates the findings to the research questions, theory and established literature. The literature review in Chapter 2 resulted in four questions that this research seeks to address. This chapter first provides a high level overview of the key findings of this research before moving on to address the findings for each research question in more detail.

7.2 A high level overview of the key findings of this research

This research aimed to explore how EMAs influence the public to prepare for mass evacuation. The findings show how the concepts of risk, knowledge and responsibility are critical for theorising how EMAs influence public preparedness for mass evacuation. The key findings grounded in these concepts include:

- Theoretically, risk is multi-functional in the governance of public preparedness. It regulates behaviour, enables surveillance and acts as a technique of exclusion.
- EMAs knowledge and how this influenced their assessment of risk, together with how they share the responsibility for public preparedness across institutions and the public, are key to the governance of public preparedness for mass evacuation. This resulted in a form of public segmentation common to all countries, whereby the public were prepared unequally.
- EMAs use their prior knowledge and assessments of risk to target public preparedness in response to particular known hazards. However, this strategy places the non-targeted public at greater risk in relation to unknown hazards, such as a man-made disaster.
- A cross-national conceptual framework of four distinctive governance practices (exclusionary, informing, involving and influencing) are utilised to influence public preparedness. These practices are explained through established theories addressing the key concepts of knowledge, risk and responsibility.
- The uncertainty associated with particular types of risk limits the application of social marketing as a strategy for influencing the public to take responsibility and can potentially increase the risk to the public.

The discussion below relates these key findings to the established literature.

7.3 Understanding how and why EMAs influence the public to prepare for mass evacuation

The first research question sought to understand how and why EMAs influence the public to prepare for mass evacuation. First, the influences on the institutional governance of public preparedness will be discussed before moving on to explain how these influenced the four governance practices (exclusionary, informing, involving and influencing) used to influence the public to prepare.

7.3.1 The influences of knowledge, risk and responsibility on the governance of preparedness

The findings showed that EMA's knowledge and how this influenced their assessment of risk, together with how they share the responsibility for public preparedness across institutions and the public, are key to the governance of public preparedness for mass evacuation. The frameworks of risk governance (Walker et al., 2010, 2013; Kuhlicke et al., 2011; IRGC, 2005, 2007; Renn et al., 2011; Klinke and Renn, 2012), risk society (Beck, 1992, 1999, 2002) and governmentality (Foucault, 1798, 2003, 2009) are drawn upon to show how the findings relate to established theory.

7.3.1.1 The influence of EMA's knowledge on the risks that the public are influenced to prepare for

Beck's (1999) concept of new knowledge is used to conceptualise the findings highlighting how EMA's knowledge and their assessment of risk determined the types of risk that they believed the public should be prepared for. Having prior knowledge of natural hazards differed to the uncertainty and lack of knowledge associated with influencing the public to prepare for mass evacuation in response to man-made hazards. Critically, the findings highlight the danger of using prior knowledge to influence the public to prepare only for known hazards, as situations that were previously considered safe can turn into hazards overnight (Beck, 1999).

Consistent with the risk governance framework (IRGC, 2005, 2007; Klinke and Renn, 2012; Renn et al., 2011), risk assessments determined the hazards that the public were influenced to prepare for. As human judgement was involved, there were particular risks that the public were prepared for and others that were ignored (Klinke and Renn, 2012). The literature highlights how uncertainty results in the public not preparing (Larsson and Enander, 1997) and in difficulties in assessing and estimating risk (Klinke and Renn, 2012; Renn et al., 2011). This research found that the limited knowledge and uncertainty associated with man-made risks resulted in higher levels of government also preferring not to prepare the public for this type of risk. This is due to concerns over scaring the public.

Terrorism is accepted as a highly uncertain risk (Klinke and Renn, 2012). However, a nuclear energy plant is perceived as having relatively low levels of uncertainty in the risk governance literature (Klinke

and Renn, 2012). This is due to the known potential impacted zone. The contradiction in this is that whilst the impacted zone is known in advance, higher levels of government are uncertain whether the public should evacuate or stay indoors until the incident occurs, which heightens the potential uncertainty for the public. This exemplifies the theoretical argument that knowledge constructs risk (Strydom, 2002; Beck, 1992). In contrast, preparing for natural hazards was characterised by reduced uncertainty resulting from the use of technology and sensors that monitored the risk's behaviour and potential impact. Thus, as argued by Beck, man-made risks are more institutionally unmanageable (Mythen, 2004) as it is considered more difficult to prepare the public for this type of risk. As a result, higher levels of government preferred to focus on crisis communication.

EMAs apply their knowledge to create risk assessments to target public preparedness in response to particular known hazards, which can result in risk assessments being based on uncertain assumptions (Renn et al., 2001). However, this also means that the non-targeted public are potentially at greater risk in relation to unknown hazards when these assumptions change rapidly. In one country a fireworks factory had been assessed as posing no risk, and it was perceived that there was no need to prepare the public. Notably, this can be conceptualised as an example of a black swan (IRGC, 2007) where there is unawareness (Beck, 1999) of the risk. Beck (1999) theorises the role that new knowledge plays in turning situations previously considered normal by experts into hazards overnight. The explosions at the fireworks factory are evidence of this new knowledge, and of the risk to the public's safety. Hence, the findings of this research highlight the dangers associated with using risk assessments to determine the risks that the public are influenced to prepare for. New risks can emerge overnight (Beck, 1999) and for the non-targeted public, the unexpected incident could result in confusion as experienced at the fireworks factory. Whilst it is recognised that risk assessments are only a prediction of the potential likelihood and impact of particular risks, there are unknown risks over and above those that are on the radar of risk assessments. For example, there was no prediction whatsoever of the 1976 Tangshan earthquake (Aven, 2013).

Hence, EMA's knowledge and the uncertainty associated with particular types of risk influenced beliefs regarding the risks that the public should be prepared for and those where the focus should be placed on crisis communication. However, the lag between the cognitive perception of prior knowledge and new knowledge, created through crisis, shows the risks of using risk assessments to target public preparedness in response to known hazards. This strategy could potentially place the non-targeted public at greater risk in relation to unknown hazards.

7.3.1.2 The influence of EMAs knowledge on the distribution of responsibilities for influencing public preparedness

The findings also show the influence that EMAs knowledge of their public had on the institutional distribution of responsibilities for influencing public preparedness. This finding can be related to the concept of governmentality (Foucault, 1978, 2003, 2009), which focuses on the importance of public knowledge and how it enables the public to be governed to achieve certain objectives (Smart, 2002).

Public preparedness was predominantly governed at the national, regional and local government levels and at an organisational level. Local governments and associated organisations generally hold responsibility for influencing the public to prepare for mass evacuation. This research found the local knowledge held by local EMAs is key in influencing public preparedness. This finding can be interpreted through Foucault's (1995) concept of hierarchical observation concerned with the visibility and surveillance of the public. It is by making the public visible that it is possible to know and alter their behaviour (Smart, 2002). Local EMAs have a spatial and relational closeness to the public enabling them to observe their public and gain knowledge on how to best influence public preparedness. The public may also be influenced to prepare and internalize the responsibility for this if they believe that their preparedness is being monitored. The responsibilities for undertaking particular preparedness tasks were also transferred to organisations considered to have the necessary knowledge and expertise to undertake the task. The implications of this distribution of responsibility for public preparedness will be discussed further in section 7.4.

Drawing on Foucault's (1978, 2003, 2009) concept of governmentality, this section discussed how close proximity to the public enables local governments to observe and gain knowledge of the public targeted with preparedness practices. Thus, institutional knowledge is critical in governing public behaviour.

7.3.1.3 The influence of risk on determining who is targeted

Unsurprisingly, the findings showed that risk is key in determining why the public are influenced to prepare for mass evacuation. Risk determined the groups of the public that EMAs attempted to influence to prepare. It follows that the public living in geographic areas considered at risk from a particular hazard are targeted. The concept of the Panopticon can be drawn upon to understand and theorise this usage of risk to show how it regulates behaviour.

In a role similar to the Panopticon (McHoul and Grace, 1993), risk was used to attempt to influence the behaviour of the public living within the geographic area (i.e. boundary) considered at risk. As outlined in Chapter 3, the Panopticon is concerned with the operation of disciplinary power through observation and visibility (Foucault, 1995). Whilst the risk (e.g. volcano, river, nuclear plant) may be visible to the public living within the geographic boundary of risk, they do not know if and when the risk will become a disaster. Similar to the role of the Panopticon (Magill, 1997), it is the possibility of the risk becoming a disaster that is used to influence the public to prepare by encouraging them to internalize this preparedness. Only targeting the public living within the areas considered at risk minimises the financial and time costs of preparing the public for mass evacuation. However, using risk in this way resulted in the belief that the public living in at risk areas were prepared whilst those living outside these areas were not.

Using risk in a role akin to the Panopticon to influence public preparedness illustrates how risk enables the surveillance, regulation and control of the public by governments (Strydom, 2002). This means that risk is multi-functional to the governance of public preparedness. Furthermore, this research found that risk was used to only regulate the behaviour of the public living in areas considered to be at risk. As discussed below, this finding illuminates the dual role of the Panopticon and how it both influences behaviour and operates as a technique of exclusion. This supports Mythen and Walklate's (2006b) argument that two types of risk management co-exist; those focusing on an inclusionary zone and those that involve exclusionary tactics. This section has drawn on the concept of the Panopticon to theorise the multi-functional use of risk and explain how practically the influence of risk resulted in the public being prepared unequally for mass evacuation. Conceptually it draws on the dual role of the Panopticon to explain how it can influence behaviour whilst also excluding the public.

7.3.1.4 The influence of disaster history on responsibilities and the maturity of preparedness

The findings showed how disasters resulted in increased emergency management responsibilities. Influencing public preparedness was a dynamic process influenced by disaster history. This resulted in the variations in the maturity of public preparedness across the seven countries.

Disasters highlighted the gaps in preparedness and the need for new roles and responsibilities to address these gaps. Highlighting the emergence of new responsibilities in response to both natural and man-made disasters is in contrast to Beck's (1995, 1999) concept of organized irresponsibility. Beck (1995, 1999) argues that there are man-made risks that no-one is responsible or accountable for or capable of dealing with (Giddens, 1999). However, this research found that following disasters existing

responsibilities were more clearly defined using legislation or that new responsibilities were introduced, therefore increasing both institutional responsibility and accountability for preparedness. Whilst man-made risks were considered more institutionally unmanageable (Mythen, 2004), there was no evidence of organized irresponsibility (Beck, 1995, 1999) in any country.

The different disaster histories of each country also meant that there were variations in the maturity of approaches to influencing public preparedness. Whilst there is no definitive evidence on the influence that disaster experience has on public preparedness (Lindell and Perry, 2004; Tierney et al., 2001), the findings revealed how both directly and indirectly experiencing (i.e. witnessing another countries experience) a disaster contributed towards the use of the four cross-national governance practices and the maturity of preparedness approaches across the seven countries. Consistent with the literature (Baker, 2009), Japan was identified as a leading expert in public preparedness as they have been enhancing their approach since the Great Kantō earthquake in 1923. For Iceland and Germany, which are countries also predominantly preparing for natural hazards, it was natural disasters occurring internally in the 1960s, 1970s, 1980s and 1990s that led to changes in emergency planning and management. Risk communication and public preparedness is relatively new to the four countries predominantly preparing for man-made threats (Belgium, Denmark, Sweden, the UK), indicating lower levels of maturity. These findings suggest that countries are more likely to review and enhance their public preparedness strategy in response to a disaster. As such, the maturity of preparedness approaches are likely to increase as more disasters occur. This research therefore supports studies identifying variations in governance based on both hazard and context (Scolobig et al., 2014; Walker et al., 2013), however, this research found contextual differences to be related to differences in disaster history.

This section has drawn on Beck's (1995, 1999) concept of organized irresponsibility to show how despite EMAs believing that the public should not be prepared for particular risks, they had responsibility to prepare themselves. It has also highlighted how disaster history contributes to the variations in the maturity of preparedness evidenced across the seven countries.

The following sections explain how the influences of EMA's knowledge, their assessment of risk and the distribution of responsibility for public preparedness resulted in the four governance practices preparing the public unequally for mass evacuation.

7.3.2 The governance practices used to influence the public to prepare for mass evacuation

Four practices conceptualised as exclusionary, informing, involving and influencing were forms of governance evident in the countries involved in this study. They are discussed below in relation to the established literature, which shows that exclusionary and informing practices are forms of governance common to all countries, whereas involving and influencing practices are less well established.

7.3.2.1 Exclusionary practices

The use of exclusionary practices was conceptualised as deliberately not targeting particular groups of the public with an approach that is used to target others. The use of exclusionary practices was determined by EMAs assessment of risk.

The public living outside areas considered to be at risk, and the public at large who are at risk from terrorism, tend to be excluded. This means that these groups were not given prior information on how to prepare for evacuation. Exclusion of the public at risk of terrorism is justified by the high risk of scaring them and because mass evacuation was considered an unlikely response. Of importance here is interviewee's need to explain the rationale for exclusion and the relationship between risk and exclusion. This stance is in contrast to the literature on influencing public preparedness which focuses predominantly on targeting different groups of the public with preparedness approaches (Mileti and Peek, 2002; Tierney et al., 2001, Lindell and Perry, 2004; Guion et al., 2007).

The degree of public exclusion in each country was based on geographic risk. This finding again illuminates the key influence of risk and how it was used in a role akin to the Panopticon to determine who was excluded. Thus, risk and the Panopticon were used as segmentation tools to determine who was targeted. Ethically, the use of segmentation strategies has been critiqued based on their potential to exclude groups of the public that need help (Brenkert, 2002). This critique is supported by the findings of this research. As institutional discourse creates risks and makes them known to the public (Mythen and Walklate, 2006b; Walklate, 2010), excluded groups would not have knowledge of potential risks. It can further be argued that excluded groups would be less likely to prepare for mass evacuation as the PADM posits that the public first need to receive information before they can start making the decision whether to undertake protective actions (Lindell and Perry, 2000, 2004). The existence of black swans (IRGC, 2007) where there is unawareness (Beck, 1999) of a risk means that the excluded public could be placed at higher risk. As discussed below, the unequal use of informing and influencing practices meant that to some extent vulnerable groups (e.g. non-native language speakers, the elderly and disabled) living in the area considered to be at risk were also excluded.

7.3.2.2 Unequal informing practices

Conceptualised as informing practices, the most widespread practice used was to provide information in advance of a known hazard so the public were knowledgeable of how to respond when an incident occurred. However, the use of informing practices resulted in the public being prepared unequally for mass evacuation.

The focus on information and knowledge, meant that informing practices were most akin to risk communication (Covello et al., 1986; Rohrmann, 1998) and passive information that is traditionally provided to the public through brochures, television and websites (Becker, 2012). Informing the public was underpinned by a legal requirement to inform the public of risks in their area. Information disseminated by all countries included how the public should respond to an incident. With the exception of Germany, the public living in countries preparing for natural hazards were informed that they should evacuate in response to a siren. Preparing the public in Germany is more difficult as whilst this country predominantly prepares for flooding (natural hazard), there are nuclear power plants in the same area (man-made hazard). The difficulty results from the different types of hazard requiring different responses. The uncertainty and lack of prior knowledge associated with man-made risks means that the public are informed of how to respond during the incident through crisis communication. Further supporting how natural hazards are more institutionally manageable than man-made risks (Mythen, 2004), more detailed information was disseminated to influence public preparedness for natural hazards. For example, prior knowledge of the risk resulted in the development of hazard maps and services enabling the public to monitor the activity of natural hazards.

The literature recommends using tailored approaches to target different groups of the public (Mileti and Peek, 2002; Lindell and Perry, 2004; Guion et al., 2007). This recommendation is partially supported by the findings related to informing school children (Ronan et al., 2001) and farmers. However, this research found that some foreigners, particularly non-native speakers, were either excluded or informed indirectly. Rather than using tailored approaches, information was provided in the national language meaning non-native speakers needed to seek out information in their own language. Non-native speakers are therefore unlikely to prepare as individuals only begin making the decision whether to prepare if risk communication is delivered in a language that they can understand (Lindell and Perry, 2004). This finding provides empirical support that *“the information people need in order to prepare...[is] unequally distributed throughout society”* (Tierney et al., 2001, p.29) and it therefore contributes to the escalation of risk of those it excludes.

Whilst informing practices were the most widespread, there is a lack of understanding of their effectiveness. Consistent with the risk communication literature (Wood et al., 2011; Terpstra et al., 2009; Haynes et al., 2008; Nathe, 2000), this research highlighted a lack of research on the effectiveness of informing practices in increasing public knowledge and a gap in understanding the factors that contribute towards the escalation of risk.

7.3.2.3 Involving practices

Conceptualised as involving practices, this practice involved public participation and the public gaining experience of how to respond. It was informed by the evidence that information alone does not influence public preparedness (Morrow, 2009; Johnston et al., 2005). However, the use of involving practices also resulted in the public being prepared unequally for mass evacuation.

Personal contact with the public they were attempting to prepare was important to local EMAs. This interaction (Becker et al., 2012; Lindell and Perry, 2004) enables public participation in preparedness activities. Involving practices was only widespread across Japan, which had higher levels of risk and established groups (i.e. Voluntary Disaster Mitigation Management Organisations) within each community that facilitated the public's participation in preparedness activities. This finding confirms the value of using community groups to influence public preparedness (Becker et al., 2012; Paton, 2008; Ballantyne et al., 2000). Theoretically the close proximity of local government and local organisations can be interpreted through Foucault's (1995) concept of hierarchical observation. Close proximity to the public means that they can involve the public in preparedness activities and gain knowledge on how to best influence the public to prepare. By directly observing the public, it is possible to know and influence their behaviour (Smart, 2002).

Involving practices focused on influencing public preparedness for evacuation in response to particular known hazards. Public participation in evacuation exercises for man-made threats, such as a nuclear accident was more challenging as this could potentially influence the incorrect behaviour and response needed at the point of the crisis. This highlights yet again how man-made risks are more institutionally unmanageable (Mythen, 2004).

The findings also highlighted the unequal use of involving practices as not all groups of the public participated in preparedness activities. Similar to the use of informing practices, both school children and farmers were targeted and thus participated in exercises. However, not all groups of the public were viewed as being able to participate. Norio et al. (2011) highlight how elderly people in Japan were

perceived as unable to participate in the regular evacuation drills held due to the evacuation centres being inaccessible to them. This research also found limited involvement of elderly and disabled people in exercises and no evidence of non-native speakers' participation. As these groups were not targeted with involving practices, they were therefore excluded. The findings of this research suggest that it is not only preparedness information that is distributed unequally (Tierney et al., 2001), but also informing and involving practices.

7.3.2.4 Influencing practices

Conceptualised as influencing practices, this practice is designed to influence the public to undertake preparedness behaviours through behavioural change. The aim is for the public to initially help themselves as the emergency services may be unable to assist the public during the first three days following a disaster (Russell et al., 1995).

Influencing practices were most akin to social marketing (Andreasen, 1994; Marshall et al., 2007; Kotler and Lee, 2008). The predominant emergency preparedness behaviours required were tangible and focused on the public creating an emergency kit or storing resources in advance of an incident. This issue is discussed below in section 7.5, which explains why the application of social marketing is limited to emergency preparedness behaviours.

Similar to the use of involving practices, influencing practices was only widespread across Japan. This was related to Japan's history and the country's knowledge of their high level of risk. Preparing predominantly for natural hazards resulted in Japan having advanced knowledge that the risk of an earthquake occurring in a particular area within the next thirty years was almost 70%. The higher levels of risk also meant that a larger proportion of the public were living within the areas considered to be at risk and would therefore be influenced to prepare. The use of influencing practices was discussed solely in relation to public preparedness for natural hazards. This highlights the difficulties associated with preparing the public for man-made risks which were found to be more institutionally unmanageable (Mythen, 2004).

Consistent with social marketing (Andreasen, 2008; Kotler and Lee, 2008), Japan's use of influencing practices involved research to measure levels of public preparedness. Research conducted at a national and local level identified high and low levels of preparedness respectively. Theoretically, local government developed a strategy to increase levels of public preparedness that is explained below as a

strategy of governmentality through biopolitics (Foucault, 2009; Gastaldo, 1997; Rabinow, 2006; Smart, 2002).

Influencing behaviour was the least used practice of the four identified even though the literature on influencing public preparedness focuses on both preparedness knowledge and behaviours (Rohrmann, 1998, Lindell and Perry, 2004). Understanding the risks and limitations of behavioural change will contribute towards understanding why studies have identified low levels of public preparedness (West and Orr, 2007; Ballantyne et al., 2000; Johnston et al., 2005; Blendon et al., 2007).

The above sections have discussed the empirical findings of this research concerned with how and why EMAs influence the public to prepare for mass evacuation in relation to the established literature. Consistent with the emergency management literature (Rohrmann, 1998, Lindell and Perry, 2000, 2004), influencing public preparedness involves providing the public with information to increase their knowledge (i.e. informing practices) and behaviour change (i.e. influencing practices). In addition, the findings showed how influencing public preparedness involves public participation in preparedness activities to gain experience of the correct response (i.e. involving practices) and the non-targeting of the public who aren't considered at risk (i.e. exclusionary practices). The public who are considered not to be at risk are not the focus of emergency management studies. Rather, by focusing on public preparedness for particular risks (Mulilis et al., 1990; Paton et al., 2009; Johnston et al., 2005; Blendon et al., 2007), studies reinforce the use of exclusionary practices. This research has contributed towards the knowledge on risk communication and the PADM (Lindell and Perry, 2000, 2004) by highlighting how the relationship between exclusionary practices and unknown risks (IRGC, 2007; Beck, 1999) can place the non-targeted public at greater risk.

The findings identifying the influences of EMAs knowledge on their assessment of risk and the distribution of responsibility for public preparedness contribute to understanding why EMAs influence the public to prepare for mass evacuation. The relationship between knowledge and risk is supported by this research (Beck, 1999; Klinke and Renn, 2012, Renn et al., 2011), as EMAs knowledge influenced their assessment of risk and the risks that they preferred to prepare the public for. In addition, the knowledge local governments and organisations could gain on the public due to their close proximity determined why they had responsibility for influencing public preparedness. Risk was found to be a key factor in determining why particular groups were (not) targeted with preparedness approaches. Theorising how the public outside the area considered at risk (i.e. the Panopticon) were not targeted, illuminates the dual role of risk as a governmentality strategy in governing the public. This dual role has

previously not been considered in the literature. In addition to influencing public behaviour, risk simultaneously operates as a technique of exclusion. By influencing the behaviour of those within the Panopticon's boundaries means that those outside are excluded by risk. This may result in different levels of behavioural change within a geographic area.

Critically, the combined influences of EMAs knowledge, risk and responsibility on the use of the four practices resulted in a form of public segmentation common to all countries. This segmentation meant that the public were influenced to prepare unequally for mass evacuation and were perceived to have different levels of preparedness.

7.4 The distribution of responsibility for public preparedness

The second research question that emerged from the literature review in Chapter 2 was concerned with understanding how EMAs distribute the responsibility for public preparedness. The findings show that responsibility was distributed at two levels; 1) between different levels of associated institutions and 2) from institutions to the public. The section below discusses the institutional distribution of responsibility and then explains how institutions distributed responsibility to the public.

7.4.1 The institutional distribution of responsibility

The distribution of responsibility (Walker et al, 2010) for public preparedness between different levels of government and organisations resulted in a segmented approach to preparing the public. This meant that the public were prepared unequally for mass evacuation. The institutional distribution of responsibility also resulted in different attitudes to public preparedness across different levels of government.

To reiterate, public preparedness was predominantly governed at the national, regional and local government levels and at an organisational level. Supporting the notion that the responsibility for managing the risk of natural hazards is shifting away from the state (Walker et al., 2010, 2013; Kuhlicke et al., 2011), this research found that national governments predominantly distributed the responsibilities for preparing the public to local governments and organisations (e.g. governmental agencies and NGOs). Walker et al. (2010) propose that this "*distributed responsibility*" could potentially result in unclear responsibilities and policy making and policy implementation tasks becoming fragmented. This is empirically supported by the findings of this research on the segmented approach to preparedness, characterized by particular levels of government and organisations preparing the public in particular areas for particular risks. However, critically, the findings showed how this

segmented approach resulted in the public being prepared unequally for mass evacuation. Responsibility was distributed to local governments to influence the public's preparedness using national government guidance and legislation. However, local governments' interpretations of this guidance and legislation could differ and potentially result in different levels of public preparedness across different geographic areas. This seems likely as interviewees highlighted the lack of consistent approaches across different areas and believed that there were different levels of public preparedness. Perceptions of different levels of public preparedness may also be a result of the distribution of preparedness responsibilities to organisations which focused on preparing the public in particular areas, for particular risks and on performing particular preparedness tasks.

The findings also showed how national governments attempt to influence local governments. The relationship between the different levels of government can be conceptualised using Foucault's (1995) concept of hierarchical observation. Surveillance was found to be hierarchical, as in addition to local government's being able to observe the public, they were observed by national governments. Issuing guidance (Coaffee et al., 2008), introducing legislation and providing training were attempts by national governments to observe and control how local governments prepared the public. In a minority of countries, local governments were also formally assessed on how they had met their responsibilities to prepare the public. The concept of hierarchical observation (Foucault, 1995) provides the conceptual tool to explain how national government's guidance and observation should have resulted in local governments consistently preparing the public across different areas. Yet, the inconsistent approach suggests that the responsibility for public preparedness is not consistently being internalized by local governments.

The institutional distribution of preparedness responsibilities also resulted in discontent between the different levels of government. The desire for national governments to take greater responsibility for preparing the public conflicted with national government's preference to not prepare the public for man-made risks. Foucault acknowledges that resistance may prevent interventions from achieving their intended objectives (Smart, 2002). Resistance can be found in institutions operating at different levels (Gastaldo, 1997) and the findings of this research suggest that resistance related to risk exists at the national level of countries preparing for man-made risks. In part, this is due to the risk of scaring the public about man-made terrorism and a belief that public preparedness would not necessarily reduce the risks for this type of hazard. As resistance to preparing the public for particular types of risk exists at the level that attempts to control how local governments influence the public to prepare,

there is the potential for this resistance to risk to filter down and influence the extent to which the public are prepared.

7.4.2 The distribution of responsibility to the public

The findings also showed evidence of the distribution of responsibility for preparedness to the public themselves. However, responsibility was not distributed equally to all groups of the public.

Consistent with the concepts of distributed responsibility (Walker et al., 2010), individualization (Beck, 1992, 1999; Beck and Beck-Gernsheim, 2001) and techniques of the self (Foucault, 1993), the majority of countries were requesting that the public take responsibility for their preparedness. This is unsurprising considering that the responsibility for resilience and security is being transferred to the public (Coaffee et al., 2008; Lentzos and Rose, 2009; Debrix and Barder, 2009; Lupton, 2006; Mythen and Walklate, 2006a, 2008; Walklate and Mythen, 2010). However, this research supports Lindell and Perry's (2004) assertion that different types of hazard may have different implications on the public's responsibility for their preparedness. The use of each governance practice determined the extent to which the responsibility for public preparedness was distributed to the public. As people living outside of the geographic areas considered to be at risk and those facing the risk of terrorism were excluded, no one had responsibility for their preparedness. The use of responsabilization strategies have been critiqued for assuming that the public are able to understand the information and accept responsibility (Hoek and Jones, 2011). However, informing practices also incorporated the notion of the general public taking responsibility to inform vulnerable groups including non-native language speakers, elderly and disabled people. Additionally, local EMAs retained responsibility for vulnerable groups by having knowledge of individuals, such as elderly and disabled people, who may need additional support when an incident occurs. Influencing practices also resulted in the most responsibility being distributed to the public. As influencing practices were designed so the public internalize behaviours to help themselves when an incident occurs, this practice required the most active contribution to public preparedness (Beck and Beck-Gernsheim, 2001; Rose, 1996). This responsabilization strategy (Burchell, 1993) required the public to take responsibility for both their preparedness and the initial response to the incident. Japan, with a widespread use of influencing practices, was also the only country to legally document the public's preparedness responsibilities. Overall, there is a shift of state responsibility to the general public for their own preparedness and the preparedness of vulnerable groups. Yet, there is currently a lack of knowledge on the influence that perceived responsibility has on public preparedness. Therefore, it is important to understand the influence that perceived responsibility has. Due to the

limited research (Lindell and Perry, 2004) and inconsistent findings on the influence of perceived responsibility, future research should explore this area.

This research has identified the distribution of responsibility (Walker et al., 2010, 2013; Kuhlicke et al., 2011) for public preparedness to local governments, organisations and the public themselves. This distribution of responsibility resulted in both the public being prepared unequally for mass evacuation and an unequal distribution of the responsibility for public preparedness. EMAs sharing the responsibility for preparing vulnerable groups with the general public may result in vulnerable groups being prepared for mass evacuation. However, no one has responsibility for the excluded groups of the public.

The findings on how EMAs distribute the responsibility for public preparedness provide evidence supporting Foucault's concepts of hierarchical observation (Foucault, 1995) and resistance (Smart, 2002; Lupton, 1997). However, the findings showing an unequal distribution of responsibility for public preparedness adds a new dimension to the governance concepts explaining how the public are now required to take responsibility for different areas of their life; distributed responsibility (Walker et al., 2010), individualization (Beck, 1992, 1999; Beck and Beck-Gernsheim, 2001) and techniques of the self (Foucault, 1993). The findings illuminated critical differences across the public, with not all groups being perceived at risk and as needing to take responsibility or being able to take responsibility. For example, responsibility was not distributed to groups considered not at risk and groups considered more vulnerable than others. The differences across the public which mean that responsibility cannot be distributed equally is not currently covered by the concepts of distributed responsibility (Walker et al., 2010), individualization (Beck, 1992, 1999; Beck and Beck-Gernsheim, 2001) and techniques of the self (Foucault, 1993). These concepts view the public as a whole and do not account for the different characteristics of a population that could render the use of responsabilization strategies inappropriate.

The findings addressing the first two research questions have provided evidence of the "conflicts" between the use of techniques of power and techniques of the self (Foucault, 1993). The simultaneous use of risk in a role akin to the Panopticon (i.e. techniques of power) (Foucault, 2003) and the use of a responsabilization strategy (i.e. techniques of the self) (Foucault, 1993) highlights their incompatibility. For example, by excluding the public through the use of risk in a role akin to the Panopticon, not everyone is targeted with a responsabilization strategy. As social marketing enables both techniques of power and techniques of the self to operate, this issue is discussed further in the next section.

7.5 Applying social marketing to influence public evacuation preparedness behaviours

The third and fourth research questions identified from the literature review were concerned with understanding the benefits, barriers and risk factors for EMAs who utilise social marketing to influence their public's evacuation preparedness behaviours and the theoretical arguments that inform this area of enquiry.

This section suggests that theoretically social marketing is a strategy of biopolitics (Foucault, 2003; Rabinow and Rose, 2006) that can be used to responsibilize the public for their preparedness. However, a key finding of this research shows how the uncertainty associated with particular types of risk limits the application of social marketing and can potentially increase the risk to the public.

7.5.1 The evidence and benefits of social marketing's application

Governments, public sector organisations and agencies increasingly use social marketing (French, 2010) to influence public behaviour. For example, Public Safety Canada (Kotler and Lee, 2008) and Rhode Island Department of Health (Marshall et al., 2007) used social marketing effectively to influence their public to prepare for emergencies. Both approaches focused on generic (i.e. not hazard specific) emergency preparedness behaviours (Kotler and Lee, 2008; Marshall et al., 2007), however, EMAs questioned the effectiveness of generic approaches. It is a contention of this research that the barriers and risks associated with the application of social marketing may restrict its application to generic emergency preparedness behaviours.

Japan was the only country widely using influencing practices, most akin to social marketing (Andreasen, 2002). To reiterate, Japan's use of research to measure public preparedness was a strategy of governmentality through biopolitics (Foucault, 2009; Gastaldo, 1997; Rabinow, 2006). Chapter 3 outlined how social marketing is a strategy of governmentality through biopolitics (Foucault, 2003; Rabinow and Rose, 2006), which is supported by the findings of this research. Consistent with social marketing (Andreasen, 2002; Kotler and Lee, 2008), a survey was undertaken to measure public preparedness in Japan. The resulting statistics provided local government with knowledge of the problem (Lee, 2007) as they indicated low levels of preparedness. Whilst 90% of people surveyed were really afraid of the earthquake, only 30% had prepared food and water. Using research and statistics to identify the low levels of preparedness enabled local government to manage the problem (Lee, 2007) by developing a strategy. Therefore, implementing social marketing as a strategy of governmentality through biopolitics (Rabinow and Rose, 2006) enables EMAs to gain knowledge of their public's preparedness and if necessary develop a strategy to increase levels of public preparedness.

Social marketing is heralded as not only addressing individual behaviour change (i.e. downstream), but also the behaviour of the policy makers and decision makers (i.e. upstream) who influence public behaviour (Andreasen, 2006; Hastings and Donovan, 2002). Whilst the literature has predominantly focused on the public (Tierney et al., 2001), the next section focuses on the EMA perspective (i.e. upstream) to understand the barriers and risks of applying social marketing to influence the public to prepare for mass evacuation.

7.5.2 The barriers and risks associated with social marketing's application

As discussed above, the findings highlighted the simultaneous use of techniques of power (Foucault, 2003) and techniques of the self (Foucault, 1993) to influence the public to prepare. Social marketing enables both techniques to operate. Using risk in a role akin to the Panopticon is a technique of power (Foucault, 1995) used as a social marketing segmentation strategy. Social marketing strategies also use risk as a technique of government to create social norms and make the public feel responsible for their health, well-being and for minimizing a raft of individualized risks (Raftopoulou and Hogg; 2010; Moor, 2011). However, the simultaneous use of both techniques means that not everyone is responsabilized for their preparedness, as those living outside the area considered to be at risk (i.e. the Panopticon) are not targeted. This research shows how the type of risk that the public are predominantly being influenced to prepare for determines whether being responsabilized or excluded could place the public at greater risk during an incident.

EMAs assessment of risk has been identified as a key influence on their approaches to influencing public preparedness. The findings also showed how the influence of risk can limit social marketing's application and potentially increase the risk to the public during a man-made incident. Social marketing approaches aim to "*mak[e] behaviour that harms less attractive*" (Department of Health, 2004, p.21). However, if social marketing is applied to influence the public to prepare for mass evacuation and mass evacuation is the incorrect behavioural response, this behaviour could harm the public (e.g. injuries, fatalities). The uncertain risk situation is therefore in contradiction with a consistent application of social marketing.

Target audience segmentation is a benchmark of social marketing (Andreasen, 2002). This research found that the segmentation strategy used by all countries was based on the risks that the public faced. However, the conceptualisation of risk is at odds with the way risk is understood in social marketing. In the case of preparedness for mass evacuation, individuals have not created the risk through their own behaviour, it is a social and structural risk not of their making that is characterised by uncertainty. This

means that groups that have not been targeted may be at less risk than those that have. To advise the public of a prescribed behaviour prior to a man-made disaster may increase an individual's risk. The uncertainty associated with mass evacuation in response to man-made risks may therefore limit the application of social marketing to focusing on generic emergency preparedness behaviours (Kotler and Lee, 2008; Marshall et al., 2007). For example, creating an emergency kit of useful resources (e.g. food, water, radio) presents no risk to the public as the kit could be used for evacuation or sheltering indoors. Generic behaviours such as these are risk free compared to the risk of prescribing behaviours for responding to an incident that could potentially increase the risk to the public.

This section has shown how in contrast to other applications of social marketing, the uncertainty associated with particular types of risk can potentially increase the risk to the public, therefore, there is a need to limit the application of social marketing to focusing on generic emergency preparedness behaviours that present no risk.

The next section outlines the theoretical contributions that have been made by addressing the four research questions discussed above.

7.6 The theoretical contributions of this research

As the emergency management field is relatively new and there is a need to advance theory (McEntire, 2004), the literature covering the institutional governance and management of risk was drawn upon to theoretically examine the practice of influencing public preparedness and to conceptualise the key issues. This resulted in the following six theoretical contributions;

7.6.1 Understanding the influences on how EMAs influence the public to prepare for mass evacuation

This research found that EMAs knowledge, their assessment of risk and the distribution of responsibility resulted in a segmented approach to preparedness whereby particular levels of government and organisations prepared the public living in particular areas to respond to particular risks. As the public were prepared unequally for mass evacuation there were perceptions of different levels of public preparedness. This finding contributes to knowledge through the identification of the influences of knowledge, risk and responsibility on the governance of public preparedness. It also addresses the lack of research on institutional approaches to preparedness and explains why particular strategies are selected (Tierney et al., 2001). As the institutional perspective was neglected in the emergency management and social marketing literature on influencing public preparedness (Tierney et al., 2001; Dyer et al., 1999; Wymer, 2011), the risk governance (Walker et al., 2010, 2013; Kuhlicke et al., 2011;

IRGC, 2005, 2007; Renn et al., 2011; Klinke and Renn, 2012), risk society (Beck, 1992, 1999, 2002) and governmentality (Foucault, 1978, 2003, 2009) literature were drawn upon to explain the influences of EMAs knowledge, risk and responsibility.

Furthermore, by showing how these influences result in a form of public segmentation involving the exclusion of particular groups, this research extends our knowledge of the conceptual application of the Panopticon (Foucault, 1995). In addition to influencing public behaviour (McHoul and Grace, 1993, Foucault, 1995), the Panopticon was used to conceptualise the segmentation that excluded particular groups of the public. This exclusion could potentially increase the risk to the public.

7.6.2 Understanding the strategies EMAs use to influence public preparedness for mass evacuation

The literature on influencing preparedness fails to capture the contradictions within the strategies. As there is a lack of evaluation on whether this literature informed EMAs attempts to prepare the public (Tierney et al., 2001), this research contributes to our understanding of some of the complexities of these strategies. For example, exclusionary practices reveals the situation of the non-targeted public. Moreover, by drawing on the concepts of black swans (IRGC, 2007) and unawareness (Beck, 1992), this research has shown how the use of exclusionary practices potentially places the non-targeted public at greater risk in relation to unknown hazards. As risk communication and the PADM do not take into account public preparedness for unknown risks, and that knowledge of a risk can change, this research has drawn on risk governance (IRGC, 2007) and risk society (Beck (1992) to enhance our understanding of the influence and potential risks resulting from using EMAs knowledge and their assessment of risk as the basis of approaches to public preparedness. However, as outlined below, this research also shows the contradiction of social marketing which may increase the risk to those who have been included.

7.6.3 Theorising the multi-functional role risk has in the governance of public preparedness

This research found that risk operates in multiple ways to govern how the public are influenced to prepare for mass evacuation. Risk determined the groups of the public that EMAs attempted to influence to prepare. Targeting the public living in geographic areas considered to be at risk enabled EMAs to use risk to observe and regulate the behaviours of those within the risk area. The findings showing the exclusion of the public living outside of the geographic areas considered to be at risk and those facing the particular risk of terrorism, contributes to knowledge on the multi-functional role risk has in the governance of public preparedness. Not only is risk used to influence public behaviour, it

also simultaneously operates as a governmental technique of exclusion. This multi-functional role of risk was theorised through the concept of the Panopticon (Foucault, 1995).

Furthermore, this research found that the type of risk (i.e. man-made or natural) was critical to EMAs approaches to influencing public preparedness and as outlined below, the application of social marketing.

7.6.4 Understanding the distribution of responsibility for public preparedness

Due to the limited research on the concept of responsibility in the emergency management and social marketing literature, the risk governance (Walker et al., 2010, 2013; Kuhlicke et al., 2011), risk society (Beck, 1992) and governmentality (Foucault, 1978, 2003, 2009) literature was utilised to explain the findings. The risk governance literature focusing on natural hazards (Walker et al., 2010) introduces the concept of “*distributed responsibility*” and how the responsibilities associated with natural hazards are being shared with different actors. This research provided empirical evidence of the concept of distributed responsibility and how distributing the responsibility for public preparedness resulted in a fragmentation of tasks (Walker et al., 2010). It has also identified how the concepts of distributed responsibility (Walker et al., 2010), individualization (Beck, 1992, 1999; Beck and Beck-Gernsheim, 2001) and techniques of the self (Foucault, 1993) do not accommodate for the heterogeneity of the public (e.g. their perceived levels of risk, their vulnerabilities). These differences and the public’s capabilities are recognised by governments and therefore particular groups are not responsabilized.

7.6.5 Contributing to knowledge on social marketing’s application

Existing research addressing social marketing’s application to disaster preparedness is limited (Ramaprasad, 2005) and does not focus on influencing public preparedness for mass evacuation. This research has contributed to knowledge on social marketing’s application in a new area. It has shown the limited use of social marketing to influence public preparedness for mass evacuation and how in the face of man-made incidents, it may increase risk. The literature views social marketing as a technique of government that may be used to responsabilize the public for different social issues (Moor, 2011, Raftopoulou and Hogg, 2010). However, if social marketing is applied to influence the public to prepare for mass evacuation in response to a particular risk, this could result in public fatalities or injuries as mass evacuation may be the incorrect response. Furthermore, by drawing on the relationship between knowledge and risk, this research highlighted the dangers associated with using a risk based segmentation strategy. As the application of social marketing to mass evacuation

preparedness could potentially increase the risk to the public, it may be more appropriate to focus on generic emergency preparedness behaviours.

7.6.6 Methodological contributions to the emergency management literature

This research also makes methodological contributions to the emergency management literature. The literature highlights the need for a more thorough and standardised conceptualisation of preparedness and how it is assessed (Paton, 2003; Tierney et al., 2001). This research has attempted to provide a more thorough conceptualisation from the EMA perspective. However, the findings suggest that a standardised conceptualisation of public preparedness may be inappropriate as approaches to public preparedness are influenced by historical context. Influencing public preparedness for mass evacuation was found to mean different things to different countries based on factors including the risk that they were preparing for, their knowledge of the risk and their countries disaster history. This resulted in the different approaches to influencing public preparedness for mass evacuation.

Furthermore, as there is a paucity of cross-national research on preparedness that compares government policies and practices (Tierney et al., 2001), this research provides a novel contribution to the existing literature by addressing this area. Additionally, by focusing on seven countries preparing their public for a variety of different hazards and threats, this research has also contributed towards the lack of research focusing on multiple hazards (Lindell and Hwang, 2008; Tierney et al.; 2001). Whilst this research was cross-national, the findings showed that the differences across countries were greatly influenced by risk. More research is also required on the influence of culture.

7.7 Conclusion

This chapter has discussed the findings of this research in relation to the established literature. The findings show how the concepts of risk, knowledge and responsibility are critical for theorising how EMAs influence public preparedness for mass evacuation. Theoretically, risk is multi-functional in the governance of public preparedness as it regulates behaviour, enables surveillance and acts as a technique of exclusion. The key findings also show how EMAs knowledge and how this influenced their assessment of risk, together with the distribution of responsibility were key to the institutional governance of public preparedness for mass evacuation. Their influence on the four distinctive governance practices used (exclusionary, informing, involving and influencing) to influence public preparedness resulted in a form of public segmentation common to all countries, whereby the public were prepared unequally for mass evacuation. As the institutional perspective has been neglected in

the literature, the governance of public preparedness has previously not been examined. Furthermore, EMAs were found to use their existing knowledge and assessments of risk to target public preparedness in response to particular known hazards. Critically, this strategy places the non-targeted public at greater risk in relation to unknown hazards. The findings also showed how the uncertainty associated with particular types of risk limits the application of social marketing to focusing on generic emergency preparedness behaviours. If social marketing is applied to a particular type of risk, it could potentially increase the risk to the public. These key findings have contributed to knowledge in the emergency management, social marketing, risk governance, risk society and governmentality literature. The next chapter outlines the practical contributions and limitations of this research and highlights opportunities for further research.

Chapter 8. Conclusion

8.1 Introduction

This chapter highlights the contributions that this research has made to practice and policy. It also examines the strengths and limitations of the research and outlines opportunities for further research.

8.2 The contributions of this research to practice and policy

By providing insight into the governance of public preparedness across seven countries (Belgium, Denmark, Germany, Iceland, Japan, Sweden and the UK) the findings offer contributions and recommendations for practice. These are highlighted in table 8.1 and are examined in more detail below.

Table 8.1 The practical contributions, recommendations and wider policy implications

Contribution to practice	Recommendations for practice	Wider policy implications
1. Identifying the different strategies (exclusionary, informing, involving and influencing) for influencing public preparedness	Use the strategy appropriate for the desired aims	Greater understanding of the implications of using different strategies
2. Understanding the implications of using risk as the basis of approaches to influencing public preparedness for mass evacuation	Consider the implications of the use of risk based exclusionary practices Focus on generic emergency preparedness behaviours that are not hazard specific (e.g. emergency kit) for man-made risks	Potential for levels of fear to increase amongst those not considered at risk
3. Identifying how particular groups of the public are targeted indirectly and therefore not responsabilized	Seek alternative strategies to directly prepare vulnerable groups	Identifying cost effective strategies Ensuring that vulnerable groups are aware that additional support is still available in a disaster
4. Understanding the limitations of social marketing's application to mass evacuation preparedness	Limit the application of social marketing to generic emergency preparedness behaviours or to only influencing mass evacuation preparedness behaviours in response to natural hazards Draw lessons from social marketing on evaluating the effectiveness of strategies in influencing public preparedness	That staff are knowledgeable of the contexts when social marketing's application could potentially increase the risk to the public The time, cost and knowledge required to conduct research to evaluate the strategy

8.2.1 Identifying how public preparedness can be influenced and why

This research provides EMAs with knowledge of the different strategies that are being used to influence public preparedness for mass evacuation across different countries and for different hazards. It shows how influencing public preparedness can involve multiple aspects of risk communication (Rohrmann, 1998; Lindell and Perry, 2004) and information (i.e. informing practices), public participation (i.e. involving practices), and behaviour change (i.e. influencing practices). As examined below, it also highlights the implications of using risk based exclusionary practices. By identifying the limitations of the different practices, EMAs can select the most appropriate strategy. For example, if the aim is to influence the public to undertake preparedness behaviours, informing practices would be inappropriate as information alone does not lead to behaviour change (Morrow, 2009; Johnston et al., 2005).

8.2.2 Understanding the implications of using risk as the basis of preparedness approaches

By relating the use of risk assessments to changing knowledge (Beck, 1999), this research also shows the dangers of using exclusionary practices. As a disaster can change knowledge of a risk overnight (Beck, 1999), the excluded public could be placed at higher risk. As the use of exclusionary practices is influenced by levels of risk, the proportion of excluded public will vary for each country. For example, this research found Japan and Iceland to have higher levels of risk and therefore a smaller proportion of the public were excluded. There is the potential for the use of countrywide preparedness programmes in schools and for public preparedness to be incorporated within existing community schemes, such as Neighbourhood Watch. However, preparing the entire population may increase levels of fear amongst the public living in areas not currently considered at risk. These groups may believe that EMAs are aware of a known risk, but are withholding information. Thus, it is important that the reason why these groups are being prepared is communicated to them.

Furthermore, this research provides EMAs with an understanding of the complexities of influencing public preparedness for mass evacuation in response to different types of risk. In particular, it has highlighted how uncertainty makes man-made hazards more institutionally unmanageable (Mythen, 2004) and how preparing the public for mass evacuation in response to particular man-made hazards could actually increase the risk to the public. However, rather than not preparing the public considered at risk of man-made hazards, there is potential for an “all-hazards” approach to public preparedness to be adopted focusing on generic emergency preparedness behaviours.

8.2.3 Targeting different groups of the public equally

This research highlights the need for EMAs to consider alternative approaches to target vulnerable groups of the public that are currently to some extent being excluded from preparedness practices. The emergency management (Tanaka, 2005; Mileti and Peek, 2002; Turner et al., 1979) and social marketing (Marshall et al., 2007) literature recommends the use of tailored approaches to target different groups of the public. Thus, there is a need for EMAs to identify alternative ways to engage directly with vulnerable groups. Whilst there may be significant costs associated with producing communications material in multiple languages, EMAs could communicate directly with non-native language speakers by providing information through established community groups. As recommended by Rosenkoetter et al. (2007), older adults could be targeted by providing information in senior centres and publications targeted at older adults. Approaches such as these would enable vulnerable groups to discuss their preparedness, any restrictions on their ability to prepare and any support they may need in order to prepare or to mass evacuate.

8.2.4 The limitations of social marketing's application to influencing public preparedness for mass evacuation

This research provides EMAs with evidence of the strengths and limitations of the application of social marketing. For example, EMAs could draw lessons from this research on conducting research to understand current levels of public preparedness and then develop a strategy based on the research findings. In contrast to the limited research on the effectiveness of risk communication as a whole in influencing public preparedness (Wood et al., 2011; Terpstra et al., 2009; Haynes et al., 2008; Nathe, 2000), social marketing can enable EMAs to monitor the effectiveness of their strategies.

However, critically, this research also provides EMAs with knowledge that there are risks associated with the application of social marketing that should be considered when developing their preparedness strategy. Whilst the social marketing approaches in the literature focused on generic emergency preparedness behaviours and targeted the public state-wide (Marshall et al., 2007) and nationwide (Kotler and Lee, 2008), this research demonstrated how social marketing could be applied in a way that potentially increases the risks to the public's safety.

8.3 Limitations of this research

This section addresses the limitations of this research.

The cross-national aspect of the research design was both a contribution and limitation of this research. As there is limited cross-national research on preparedness (Tierney et al., 2001), the researcher did not have a framework to consult to guide the design of this research. Whilst the generic literature on conducting cross-national research was reviewed to identify how to conduct research cross-nationally and to understand the particular challenges of collecting data from multiple countries, studies focused specifically on public preparedness would have potentially enabled the researcher to overcome some of the challenges faced faster. Related to this is how this research was restricted to the use of both literature and preparedness communications materials written in English. This issue could have been addressed by working with researchers in other European countries to translate and communicate the key information from the documents written in other languages but due to resource limitations this was not possible. However, the number of journal articles covering public preparedness not written in English was considered to be very few and the preparedness communications materials collected were discussed with interviewees, whether or not they were written in English.

There were also methodological limitations based on the research sample. As this research was based on the ERGO project, the PhD study only involved understanding the perspective of EMAs that were interested in mass evacuation preparedness. Including EMAs that were not interested may have provided alternative views. However, although all of the EMAs participating in this study were interested in mass evacuation preparedness, this research found that there were multiple and sometimes conflicting views of influencing public preparedness for mass evacuation. A further limitation related to the research sample was the participation of only one country outside of Europe. This research may have been strengthened by the participation of an additional country outside of Europe, such as the United States, the other recognised leader in natural disasters (Baker, 2009). Including the United States would have provided a more direct comparison to Japan, however, due to funding limitations this was not possible. A final limitation of the research sample was related to the reliance on key informants scheduling the interviews and the critical role of the interviewees. Due to these two factors, it was not possible to consistently interview the three levels of government and the equivalent organisations in each country. The need for EMAs to respond to emergencies on demand and the changing organisational structure in Sweden, also resulted in variations in the number of interviews held in each country. However, in order to include a variety of perspectives in each country, interviews were conducted with at least two levels of government.

A limitation of this research is the process of data collection and data analysis. As outlined in Chapter 4, the qualitative data analysis method adopted (Miles and Huberman, 1994) recommends that

researchers code the field notes collected from the previous data collection visit before making the next visit. This is also a fundamental component of grounded theory approaches (Bryman, 2004). Due to the demands of collecting data from seven countries at the convenience of key informants, it was not possible to code any data before the next data collection visit. As such, a purist grounded theory research design using the constant comparative method could not be employed despite its suitability. However, the method of data analysis used was influenced by grounded theory. To address the issue of being unable to code the data in between data collection visits, the researcher made detailed handwritten notes in each interview that were reviewed in between visits. The continuous access to interviewees to follow up new insights emerging from the coding process also mitigated this issue.

8.4 The theoretical strengths of this research

A strength of this research is how it has advanced theory in the relatively new field of emergency management (McEntire, 2004). Chapter 7 examined the theoretical contributions that this research makes in detail. These contributions were made by drawing on the theoretical frameworks of risk governance (Walker et al., 2010, 2013; Kuhlicke et al., 2011; IRGC, 2005, 2007; Renn et al., 2011; Klinke and Renn, 2012), risk society (Beck, 1992, 1999, 2002) and governmentality (Foucault, 1798, 2003, 2009). These frameworks are not normally applied to emergency management research focusing on influencing public preparedness, however, they provided a lens for the researcher to conceptually understand the complexities of how EMAs influence public preparedness. By drawing on the frameworks and their associated concepts, she was able to interpret and theorise the findings of this research.

8.5 Opportunities for further research

To summarise, this research has examined EMA perspectives of and approaches to influencing public preparedness for mass evacuation. It has identified how the concepts of risk, knowledge and responsibility are critical for theorising how EMAs influence public preparedness for mass evacuation. The key findings grounded in these concepts and that have been discussed in relation to theory, include:

- Theoretically, risk is multi-functional in the governance of public preparedness. It regulates behaviour, enables surveillance and acts as a technique of exclusion.
- EMAs knowledge and how this influenced their assessment of risk, together with how they share the responsibility for public preparedness across institutions and the public, are key to

the governance of public preparedness for mass evacuation. This resulted in a form of public segmentation common to all countries, whereby the public were prepared unequally.

- EMAs use their prior knowledge and assessments of risk to target public preparedness in response to particular known hazards. However, this strategy places the non-targeted public at greater risk in relation to unknown hazards, such as a man-made disaster.
- A cross-national conceptual framework of four distinctive governance practices (exclusionary, informing, involving and influencing) are utilised to influence public preparedness. These practices were explained through established theories addressing the key concepts of knowledge, risk and responsibility.
- The uncertainty associated with particular types of risk limits the application of social marketing as a strategy for influencing the public to take responsibility and can potentially increase the risk to the public.

Further research should examine the influence that perceived responsibility has on public preparedness. EMAs were found to distribute the responsibility for public preparedness to the public themselves. However, this responsibility was not distributed equally as groups outside of the geographic boundary of risk (i.e. the Panopticon) were excluded from the responsabilization strategy. As EMAs are using a responsabilization strategy, albeit partially, it is important to understand the influence that perceived responsibility has on public preparedness. However, there is limited research on the influence that perceived responsibility has on public preparedness (Paton et al., 2005, Lindell and Perry, 2004) and the studies that have investigated its influence have produced inconsistent findings (Lindell and Whitney, 2000; Terpstra and Gutteling, 2008). Further research should be undertaken to understand and confirm its influence. Furthermore, research could explore whether the influence and concept of perceived responsibility varies across different groups of the public. For example, EMAs were not transferring the responsibility for public preparedness to vulnerable groups such as non-native language speakers and elderly and disabled people, but were sharing the responsibility for the preparedness of these groups with the wider public. Further research could focus on the perspectives of groups of the public that may be unable to accept responsibility for their preparedness due to their vulnerabilities.

This research has demonstrated how disasters influenced the maturity of countries approaches to public preparedness. As this research was undertaken prior to the 2011 earthquake, tsunami and nuclear disasters in Japan, a longitudinal research design could be used to further understand the

influence that disasters have on the maturity of EMAs approaches. Understanding the changes in EMAs approaches to influencing public preparedness in Japan, following the 2011 disasters, would be particularly interesting as Japan was already a leader in natural disasters (Baker, 2009) prior to the 2011 disasters. Further research could examine the extent to which their already advanced approach matured, if at all, in response to the disasters. The complex nature of the disasters (i.e. both natural and man-made) may provide another interesting angle to investigate in terms of how experiencing different types of disaster impacted upon their approaches to influencing public preparedness.

Finally, future research should focus on further understanding social marketing's application in areas outside of public health. Whilst social marketing has been critiqued previously from an ethical point of view (Raftopoulou and Hogg, 2010; Laczniak et al., 1979, Hoek and Jones, 2011, Brenkert, 2002), this research has demonstrated how the use of social marketing techniques to influence the public to undertake mass evacuation preparedness behaviours could potentially increase the risk to the public. As the application of social marketing is widening, it is important for further research to examine the characteristics of the different behaviours that social marketing should (not) be applied to.

8.6 Conclusion

This chapter has highlighted the practical contributions made by this research. These contributions are based on the identification of the strategies EMAs may use to influence public preparedness, understanding the implications of using risk as the basis of public preparedness approaches, identifying how particular groups are targeted indirectly and understanding social marketing's application to influencing public preparedness for mass evacuation. The chapter has also examined the limitations of this research in terms of the lack of cross-national research on preparedness to guide the design of this study, the research sample and the process of data collection and analysis. It also outlined three opportunities to conduct further research, including; an examination of the influence of perceived responsibility on public preparedness, a longitudinal research design to gain an in-depth understanding of how disasters impact on EMA approaches to public preparedness and on social marketing's application outside of public health to understand the characteristics of the behaviours where the application of social marketing could potentially increase the risk to the public.

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Appendix 1

Behavioural Change Theories and Models (from Gordon, 2011, Appendix C)





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